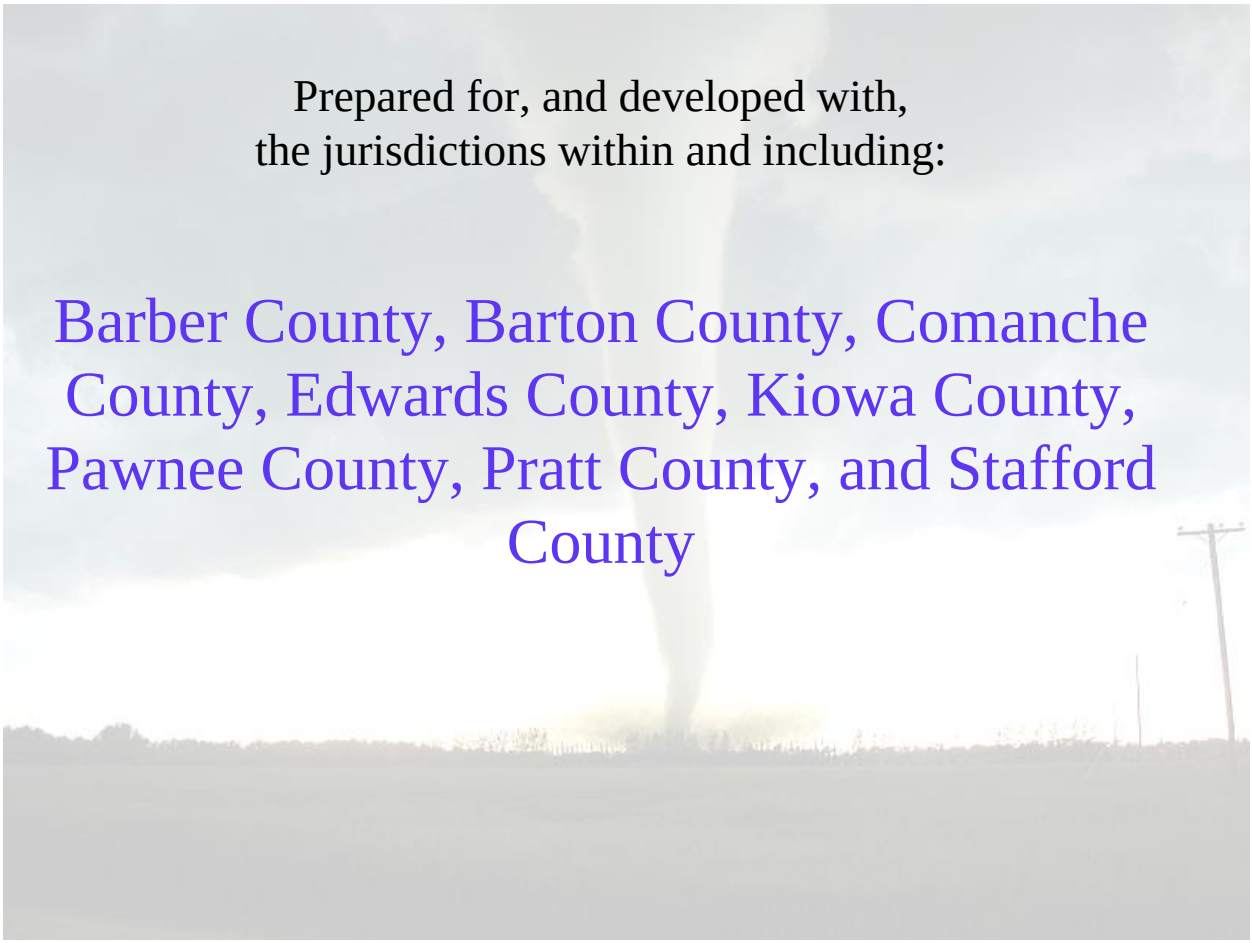
Kansas Homeland Security Region E Hazard Mitigation Plan



Prepared for, and developed with,
the jurisdictions within and including:

Barber County, Barton County, Comanche County, Edwards County, Kiowa County, Pawnee County, Pratt County, and Stafford County

FEMA Approved Pending Adoption - December 6, 2019

Barton County BOCC Adopted

Resolution 2020-1

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Prepared By:

Blue Umbrella Solutions, LLC

Table of Contents

SECTION **PAGE**

SECTION **PAGE**

List of Appendices

List of Commonly Used Acronyms

Acronym	Meaning
CPRI	Calculated Priority Risk Index
CDC	Centers for Disease Control and Prevention
CWD	Chronic Wasting Disease
CFR	Code of Federal Regulations
CRS	Community Rating System
CWPP	Community Wildfire Protection Plans
EAB	Emerald Ash Borer
EAP	Emergency Action Plan
EMAP	Emergency Management Accreditation Program
EF	Enhanced Fujita
EPA	Environmental Protection Agency
ºF	Fahrenheit
FEMA	Federal Emergency Management Agency
HAZUS	FEMA Loss Estimation Software
FIRM	Flood Insurance Rate Map
GIS	Geographic Information System
GDP	Gross Domestic Product
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Planning
HazMat	Hazardous Materials
ISO	Insurance Service Office
KDA	Kansas Department of Agriculture
KDHE	Kansas Department of Health and Environment
KDOT	Kansas Department of Transportation
KDEM	Kansas Division of Emergency Management
KFS	Kansas Fire Service
KGS	Kansas Geological Survey
KSFM	Kansas State Fire Marshall
K.S.A	Kansas Statutes Annotated
KWO	Kansas Water Office
LEPC	Local Emergency Planning Committee
MPC	Mitigation Planning Committee
NCEI	National Centers for Environmental Information
NFIP	National Flood Insurance Program
NLCD	National Land Cover Database
NLD	National Levee Database
NLIR	National Levee Inventory Report
NLSP	National Levee Safety Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
NWS	National Weather Service

Acronym	Meaning
NSFHA	No Special Flood Hazard Area
NGO	Non-Governmental Organization
NRC	Nuclear Regulatory Commission
OHMS	Office of Hazardous Materials Safety
PDSI	Palmer Drought Severity Index
PHMSA	Pipeline and Hazardous Materials Safety Administration
PDM	Pre-Disaster Mitigation
PAL	Provisionally Accredited Levee
RL	Repetitive Loss
Risk MAP	Risk Mapping, Assessment and Planning
REC	Rural Electric Cooperative
SRL	Severe Repetitive Loss
SFHA	Special Flood Hazard Area
USD	Unified School District
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WUI	Wildland Urban Interface

1.0 Introduction, Assurances and Adoption

1.1 – Introduction

Mitigation is commonly defined as sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects. Hazard mitigation planning provides communities with a roadmap to aid in the creation and revision of policies and procedures, and the use of available resources, to provide long-term, tangible benefits to the community. A well-designed hazard mitigation plan provides communities with realistic actions that can be taken to reduce potential vulnerability and exposure to identified hazards.

This Hazard Mitigation Plan (HMP) was prepared to provide sustained actions to eliminate or reduce risk to people and property from the effects of natural and man-made hazards. This plan documents the State of Kansas Homeland Security Region E (hereafter referred to as Kansas Region E) and its participating jurisdictions planning process and identifies applicable hazards, vulnerabilities, and hazard mitigation strategies. This plan will serve to direct available community and regional resources towards creating policies and actions that provide long-term benefits to the community. Local and regional officials can refer to the plan when making decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives.

Specifically, this hazard mitigation plan was developed to:

- Update the Kansas Region E 2014 Hazard Mitigation Plan
- Build for a safer future for all citizens
- Foster cooperation for planning and resiliency
- Identify, prioritize and mitigate against hazards
- Asist with sensible and effective planning and budgeting
- Educate citizens about hazards, mitigation and preparedness
- Comply with federal requirements

As stipulated in the Disaster Mitigation Act of 2000 (DMA 2000) Section 322, federally approved mitigation plans are a prerequisite for mitigation project grants. Development and Federal Emergency Management Agency (FEMA) approval this plan will ensure future eligibility for federal disaster mitigation funds through the Hazard Mitigation Grant Program (HMPG), Pre-Disaster Mitigation Grant Program (PDM), Repetitive Flood Claims, and a variety of other state and federal programs. This Plan was prepared to meet the requirements of the DMA 2000, as defined in regulations set forth by the Interim Final Rule (44 CFR Part 201.6).

This plan has been designed to be a living document, a document that will evolve to reflect changes, correct any omissions, and constantly strive to ensure the safety of Kansas Region E.

1.2 – Participating Jurisdictions

44 CFR 201.6(a)(4): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

All eligible jurisdictions were invited to participate in the organization, drafting, completion and adoption of this plan. Invited jurisdictions included, but were not limited to, elected officials, relevant State of Kansas agencies, counties, cities, school districts, non-profit agencies, and businesses.

In order to have an approved hazard mitigation plan, DMA 2000 requires that each jurisdiction participate in the planning process. Each jurisdiction choosing to participate in the development of the plan were required to meet detailed participation requirements, which included the following:

- When practical and affordable, participation in planning meetings
- Provision of information to support the plan development
- Identification of relevant mitigation actions
- Review and comment on plan drafts
- Formal adoption of the plan

Based on the above criteria, the following jurisdictions participated in the planning process, and will individually as a jurisdiction adopt the approved hazard mitigation plan:

Table 1.1: Barber County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Barber County	x	x
City of Hardtner	x	x
City of Hazelton	x	x
City of Isabel	x	x
City of Kiowa	x	x
City of Medicine Lodge	x	x
City of Sharon	x	x
City of Sun City	x	x
USD #254 - Barber County North	x	x
USD #255 - South Barber County	x	x
Alfalfa Rural Electric Cooperative (REC)	x	x
Ninnescah REC	x	x
South Pioneer REC	x	x

Table 1.2: Barton County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Barton County	x	x
City of Albert	x	x
City of Claflin	x	x
City of Ellinwood	x	x

Table 1.2: Barton County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
City of Galatia	x	x
City of Great Bend	x	x
City of Hoisington	x	x
City of Olmitz	x	x
City of Pawnee Rock	x	x
City of Susank	x	x
USD #112 - Claflin	x	x
USD #355 - Ellinwood	x	x
USD #428 - Great Bend	x	x
USD #431 - Hoisington	x	x
Barton County Community College	x	x
Ark Valley REC	x	x
Midwest Energy	x	x
Post Rock Rural Water District	x	x
Rolling Hills REC	x	x

Table 1.3: Comanche County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Comanche County	x	x
City of Coldwater	x	x
City of Protection	x	x
City of Wilmore	x	x
USD #300- Comanche County	x	x
CMS Electrical Cooperative	x	x
Southern Pioneer	x	x

Table 1.4: Edwards County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Edwards County	x	x
City of Belpre	x	x
City of Kinsley	x	x
City of Lewis	x	x
City of Offerle	x	x
USD #347 - Kinsley / Offerle	x	x
USD #502 - Lewis	x	x
Midwest Energy	x	x
Ninnescah REC	x	x
Pawnee Watershed Joint District Number 81		x

Table 1.5: Kiowa County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Kiowa County	x	x
City of Greensburg	x	x
City of Haviland	x	x

Table 1.5: Kiowa County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
City of Mullinville	x	x
Barclay College		x
USD #422 - Kiowa County	x	x
USD #474 - Haviland	x	x
Haviland Care Center		x
Iroquois Center		x
Kiowa County Hospital		x
CMS Electrical Cooperative	x	x
Greensburg Municipal Electric	x	x
Ninnescah REC	x	x
Southern Pioneer REC	x	x
Victory Electric		x

Table 1.6: Pawnee County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Pawnee County	x	x
City of Burdett	x	x
City of Garfield	x	x
City of Larned	x	x
City of Rozel	x	x
USD #495 – Fort Larned	x	x
USD #496 – Pawnee Heights	x	x
Midwest Energy	x	x
Pawnee Watershed Joint District Number 81		x

Table 1.7: Pratt County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Pratt County	x	x
City of Byers	x	x
City of Coats		x
City of Cullison	x	x
City of Iuka	x	x
City of Pratt	x	x
City of Preston	x	x
City of Sawyer	x	x
USD #382 - Pratt	x	x
USD #438 – Skyline Schools	x	x
Pratt Community College	x	x
Midwest Energy	x	x
Ninnescah REC	x	x
Southern Pioneer REC	x	x

Table 1.8: Stafford County Participating Jurisdictions

Jurisdiction	2014 HMP Participant	2019 HMP Participant
Stafford County	x	x
City of Hudson	x	x
City of Macksville		x
City of Radium	x	x
City of Seward	x	x
City of St. John	x	x
City of Stafford	x	x
USD #349 - Stafford	x	x
USD #350 – St. John-Hudson	x	x
USD #351 - Macksville	x	x
Ark Valley REC	x	x
Midwest Energy	x	x
Ninnescah REC	x	x

Any Kansas Region E jurisdiction not covered in this HMP is either covered under another plan or declined to participate.

1.3 – Assurances

Kansas Region E and all participating jurisdictions certify that they will comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).

This hazard mitigation plan was prepared to comply with all relevant the requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended by the DMA 2000. This plan complies with all the relevant requirements of:

- Code of Federal Regulation (44 CFR) pertaining to hazard mitigation planning
- FEMA planning directives and guidelines
- Interim final, and final rules pertaining to hazard mitigation planning and grant funding
- Relevant presidential directives
- Office of Management and Budget circulars
- Any additional and relevant federal government documents, guidelines, and rules.

1.4 – Authorities

For all jurisdictions within Kansas Region E all authority is subject to prescribed constraints, as all of Kansas political subdivisions must not act without proper delegation from the State. However, cities and counties in Kansas have broad home rule powers. Local governments in Kansas have a wide range of tools available to them for implementing mitigation programs, policies, and actions. A local jurisdiction may utilize any or all of the following broad authorities granted by the State of Kansas:

- Regulation
- Acquisition
- Taxation
- Spending

In addition, Kansas local governments have been granted broad regulatory authority in their jurisdictions. Kansas Administrative Regulations bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances. Since hazard mitigation can be included under the police power (as protection of public health, safety, and welfare), towns, cities, and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances", which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard.

The Kansas Region E HMP relies on the authorities given to it by the State of Kansas and its citizens as encoded in state law. This plan is intended to be consistent with all policies and procedures that govern activities related to the mitigation programing and planning. In all cases of primacy, State of Kansas laws, statutes, and policies will supersede the provisions of the plan. This HMP attempts to be consistent following:

- Kansas Constitution, Article 12 Section 5: Home rule powers
- Kansas Administrative Regulation 56-2: Standards for local disaster agencies
- 2016 Kansas Statutes, Chapter 12, Article 7: Allows cities and municipalities to designate flood zones and restrict the use of land within these zones
- 2016 Kansas Statutes Chapter 24, Article 12: Establishes watershed districts
- 2016 Kansas Statutes, Chapter 48, Article 9: Promulgating the Kansas Emergency Management Act, requiring counties to establish and maintain a disaster agency responsible for emergency management and to prepare a county emergency response plan
- 2016 Kansas Statutes, Chapter 65, Article 57: Promulgating the Kansas Emergency Planning and Community Right to-Know Act
- The Robert T. Stafford Disaster Relief and Emergency Assistance Act as amended by the Disaster Mitigation Act of 2000 (Public Law 106-390 – October 30, 2000)
- 44 CFR Part 201.6: Local mitigation plans

In addition, this plan will be consistent with all relevant federal authorities as well as Emergency Management Accreditation Program (EMAP) mitigation standards.

1.5 – Adoption Resolutions

44 CFR Requirement 201.6(c)(5): Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Upon review and approved pending adoption status by FEMA Region VII adoption resolutions will be signed by the participating jurisdictions and tracked by the Regional Mitigation Plan Project Manager with KDEM.

While not required, private, non-profit and charitable organizations that independently participated in this planning effort are encouraged to adopt the plan.

Adoption resolutions may be found in Appendix A.

2.0 Planning Process

2.1 – Documentation of the Planning Process

44 CFR 201.6(c)(1): Documentation of 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.

In June 2019, Kansas Region E and its participating jurisdictions began the process to update the Kansas Region E 2014 HMP. It was determined that Jeanne Bunting, the State of Kansas Hazard Mitigation Planner would serve as the project manager, directing this plan update, and would act as the primary point-of-contact throughout the project.

The State of Kansas contracted with Blue Umbrella Solutions to assist in updating the 2014 Kansas Region E HMP. Blue Umbrella's roles included:

- Ensure that the hazard mitigation plan meets all regulatory requirements
- Assist with the determination and ranking of hazards
- Assist with the assessment of vulnerabilities to identified hazards
- Assist with capability assessments
- Identify and determine all data needs and solicit the information from relevant sources
- Assist with the revision and development of the mitigation actions
- Development of draft and final planning documents

Kansas Region E and its participating jurisdiction undertook the following steps to update and create a robust HMP:

- Review of the 2014 Kansas Region E HMP
- Review of current related planning documents
- Delivery of organizational and planning meetings
- Solicitation of public input as to plan development
- Assessment of potential risks
- Assessment of vulnerabilities and assets
- Development of the mitigation actions
- Development of a draft multi-hazard mitigation plan
- Implementation, adoption, and maintenance of the plan

The process established for this planning effort is based on DMA 2000 planning and update requirements and the FEMA associated guidance for hazard mitigation plans. The FEMA four step recommended mitigation planning process, as detailed below, was followed:

1. Organize resources
2. Assess risks
3. Develop a mitigation plan
4. Implement plan and monitor progress

To accomplish this, the following planning process methodology was followed:

- Inform, invite, and involve other mitigation plan stakeholders throughout the state, including federal agencies, state agencies, regional groups, businesses, non-profits, and local emergency management organizations.
- Conduct a thorough review of all relevant current and historic planning efforts
- Collect data on all related state and local plans and initiatives. Additionally, all related and relevant local plans were reviewed for integration and incorporation.
- Develop the planning and project management process, including methodology, review procedures, details about plan development changes, interagency coordination, planning integration, and the organization and contribution of stakeholders.
- Develop the profile of the county and participating jurisdictions.
- Complete a risk and vulnerability assessment using a Geographic Information System (GIS) driven approach using data from various local, state and federal agency resources.
- Develop a comprehensive mitigation strategy effectively addressing their hazards and mitigation program objectives. This included identifying capabilities, reviewing pre and post disaster policies and programs, identifying objectives and goals, identifying mitigation actions and projects, and assessing mitigation actions and projects.
- Determination and implementation of a plan maintenance cycle, including a timeline for plan upgrades and improvements.
- Submission of the plan to FEMA Region VII for review and approval and the petition all participating jurisdictional governments for a letter of formal plan adoption.

2.2 – 2019 Plan Changes

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

The Kansas Region E HMP has undergone significant revision and upgrading since its last edition. Not only has the region made significant efforts to improve the functionality and effectiveness of the plan itself but is has significantly improved its hazard mitigation program. This grants the region's improved and robust hazard mitigation program a better base to further mold and improve its mitigation strategy over the next five years.

As part of this planning effort, each section of the previous mitigation plan was reviewed and completely revised. The sections were reviewed and revised against the following elements:

- Compliance with the current regulatory environment
- Completeness of data
- Correctness of data
- Capability differentials
- Current state environment

In addition to data revisions, the format and sequencing of the previous plan was updated for ease of use and plan clarity.

During this process, and after a thorough review and discussion with all participating jurisdictions and stakeholders, it was determined that the priorities of the overall community in relation to hazard mitigation planning have not changed during the five years of the previous planning cycle.

2.3 – Mitigation Planning Committee

Upon project initiation a mitigation planning committee (MPC), generally consisting of participating county emergency managers, was formed. From project inception to completion, the MPC was involved in each major plan development milestone, and fully informed through on-site meetings and electronic communication. Prior to the plan's submission to FEMA, the MPC was invited to review the plan and provide input.

In general, all MPC members were asked to participate in the following ways:

- Provide local engagement with all participating jurisdictions
- Attend and participate in meetings
- Assist with the collection of data and information
- Review planning elements and drafts
- Integrate hazard mitigation planning elements with other planning mechanisms
- Facilitate jurisdictional coordination and cooperation
- Assist with the revision and development of mitigation actions

MPC members who were unable to attend meetings due to budgetary or personnel constraints were contacted via email or phone to discuss hazard mitigation planning, including the process, goals, mitigation actions, local planning concerns and plan review.

Each MPC member was thoroughly interviewed regarding their jurisdiction's and sub-jurisdiction's mitigation related activities. These interviews were invaluable in fully integrating the resources necessary to produce this plan, document mitigation activities, and document the mitigation resources available to better increase resiliency.

Additionally, the MPC was used as a conduit to solicit input from all participating jurisdictions under the county. Where appropriate, the MPC solicited the assistance of technical experts from various agencies and groups. When the MPC updated and improved the plan's mitigation strategy, personnel from strategically selected agencies were interviewed to provide input on their mitigation capabilities.

The following participants were selected for the MPC.

Table 2.1: Kansas Region E Mitigation Planning Committee

Participant	Title	Organization
Mike Loreg	Emergency Manager	Barber County
Amy Miller	Emergency Manager	Barton County
John Lehman	Emergency Manager	Comanche County
Mike McMoran	Assistant Director	Comanche County
Richard Neilsen	Emergency Manager	Edwards County
Ray Stegman	Emergency Manager	Kiowa County
Mark Wagner	Emergency Manager	Pawnee County
Tim Branscom	Emergency Manager	Pratt County
Phil Nusser	Emergency Manager	Stafford County
Jeanne Bunting	Mitigation Planner	State of Kansas
Matt Eyer	Plan Author	Blue Umbrella Solutions

2.4 – Jurisdictional Representation

Each participating jurisdiction delegated a point of contact to represent that jurisdiction during the planning process. From project inception to completion these representatives were kept fully informed concerning the planning process, milestones, and participation requirements. In general, jurisdictional representatives were asked to participate in the following ways:

- If possible, attend and participate in meetings
- Provide jurisdiction specific data and information
- Review planning elements and drafts
- Integrate hazard mitigation planning elements with jurisdictional planning mechanisms
- Assist with the revision and development of mitigation actions

The following details jurisdictional representation.

Table 2.2: Barber County Jurisdictional Representatives

Jurisdiction	Representative	Title
Barber County	Mike Loreg	Emergency Manager
City of Hardtner	Stacy Black	Mayor
City of Hazelton	Lavina Stewart	Mayor
City of Isabel	Kathy Balding	Mayor
City of Kiowa	Ronald Rohr	Mayor
City of Medicine Lodge	Alison Morsberger	City Clerk
City of Sharon	Deborah Benisch	City Clerk
City of Sun City	Michael Wayne	Mayor
USD #254 - Barber County North	Mark Buck	Superintendent
USD #255 - South Barber County	Dr. Mylo Miller	Superintendent
Alfalfa REC	Greg Goetz	General Manager
Ninnescah REC	Robert Lamatsch	Manager of Operations
Southern Pioneer REC	Phillip Baker	Manager of Engineering

Table 2.3: Barton County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of Albert	Lois Ritterhouse	City Clerk
City of Claflin	Patricia Schmidt	City Clerk
City of Ellinwood	Chris Komarek	City Manager
City of Galatia	Steve Wilhelm	Mayor
City of Great Bend	Luke McCormick	Fire Chief
City of Hoisington	Johnathan Mitchell	City Manager
City of Olmitz	Lisa Suchy	City Clerk
City of Pawnee Rock	Sharon Anglemyer	City Clerk
City of Susank	Patty Trapp	City Clerk
USD #112 - Claflin	Greg Clark	Superintendent
USD #355 - Ellinwood	Ben Jacobs	Superintendent
USD #428 - Great Bend	Kris Thexton	Superintendent
USD #431 - Hoisington	Cherie Nicholson	Superintendent
Barton County Community College	Mark Dean	VP of Administration
Arkansas Valley REC	Jackie Holmberg	Representative
Midwest Energy	Dale Giebler	Representative
Rolling Hills REC	Marc Martin	Representative

Table 2.4: Comanche County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of Coldwater	Penny Bruckner	Mayor
City of Protection	Ron Sawyers	Mayor
City of Wilmore	Terry Lillwiller	Mayor
USD #300- Comanche County	Buddy Hooper	Superintendent
CMS Electrical Cooperative	Russell Blehm	Operations Manager
Southern Pioneer REC	Phillip Baker	Manager of Engineering

Table 2.5: Edwards County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of Belpre	Jerry Stapleton	Mayor
City of Kinsley	Karen Myers	City Clerk
City of Lewis	Susanna Salter	Mayor
City of Offerle	Carrie Barlow	City Clerk
USD #347 - Kinsley / Offerle	Robert Davies	Superintendent
USD #502 - Lewis	Michael McDermeit	Superintendent
Midwest Energy	Dale Giebler	Representative
Ninnescah REC	Robert Lamatsch	Manager of Operations

Table 2.6: Kiowa County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of Greensburg	Christy Pyatt	City Clerk
City of Haviland	Shari McAfee	City Clerk
City of Mullinville	Jewel Hager	City Clerk
Barclay College	Royce Frazier	President

Table 2.6: Kiowa County Jurisdictional Representatives

Jurisdiction	Representative	Title
USD #422 - Kiowa County	Staci Derstein	Superintendent
USD #474 - Haviland	Mark Clodfelter	Superintendent
CMS Electrical Cooperative	Russell Blehm	Operations Manager
Haviland Care Center	Karel Page	Administrator
Iroquois Center	Caroline Covey	Risk Manager
Kiowa County Hospital	Mary Sweet	Administrator
Midwest Energy	Dale Giebler	Representative
Ninnescah REC	Robert Lamatsch	Manager of Operations
Southern Pioneer REC	Phillip Baker	Manager of Engineering
Victory Electric	Mikey Goddard	VP of Safety

Table 2.7: Pawnee County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of Burdett	Linda Schadel	City Clerk
City of Garfield	Linda Meckfessel	City Clerk
City of Larned	Bradley Eilts	City Manager
City of Rozel	Helen Thorne	City Clerk
USD #495 – Fort Larned	Bryce Wachs	Superintendent
USD #496 – Pawnee Heights	Casey Robinson	Superintendent
Midwest Energy	Dale Giebler	Project Manager
Pawnee Watershed Joint District Number 81	Randy Sill	Manager

Table 2.8: Pratt County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of Byers	Isaias Uribe	Mayor
City of Coats	Tiffany Ailstock	Mayor
City of Cullison	Kody Davidson	City Clerk
City of Iuka	Marsha Giggy	Mayor
City of Pratt	Lola Shumway	Public Works Secretary
City of Preston	Randy Sheets / Ethel Carter	Mayor / City Clerk
City of Sawyer	Barbara Short	City Clerk
USD #382 - Pratt	Kerri Boldt	Assistant Maintenance Director
USD #438 – Skyline Schools	Becca Flowers	Superintendent
Pratt Community College	Justin Schwab	PCC Security
Midwest Energy	Dale Giebler	Representative
Ninnescah REC	Robert Lamatsch	Manager of Operations
Southern Pioneer REC	Phillip Baker	Manager of Engineering

Table 2.9: Stafford County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of Hudson	Sheila Witt	City Clerk
City of Macksville	Julie Bissell	City Clerk
City of Radium	Jessica Neeland	City Clerk
City of Seward	Barbara Owen	City Clerk

Table 2.9: Stafford County Jurisdictional Representatives

Jurisdiction	Representative	Title
City of St. John	Jamie Getty	City Clerk
City of Stafford	Julie Lyon	Mayor
USD #349 - Stafford	Traci Becker	Superintendent
USD #350 – St. John-Hudson	Josh Meyer	Superintendent
USD #351 - Macksville	Greg Rinehart	Superintendent
Arkansas Valley REC	Jackie Holmberg	Representative
Midwest Energy	Dale Giebler	Representative
Ninnescah REC	Robert Lamatsch	Manager of Operations

2.5 – Local and Regional Stakeholder Participation

44 CFR Requirement 201.6(b)(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

Within Kansas Region E there are many jurisdictions and organizations who have a vested interest in participating in the creation and adoption of the hazard mitigation plan. An integral part of the planning process included the identification, development, and coordination of these entities. The Kansas Region E MPC provided the opportunity for neighboring communities, counties, and local and regional development agencies to be involved in the planning process. Where applicable, these entities were kept informed of the hazard mitigation process during state, regional and local emergency management meetings, gatherings and conferences, in person by MPC members, or were solicited for planning information.

It is worth noting that all neighboring Kansas counties are undergoing a similar mitigation planning effort, and as part of this statewide process all county and state planners are working together toward common mitigation goals. During the creation and adoption of this plan communication channels were opened to facilitate the cross pollination of ideas, to incorporate neighboring regions concerns, and to ensure the overall preparedness of the State of Kansas.

In addition, relevant federal, regional, state, local governmental, and private and non-profit entities were also invited to provide input and utilized for information and technical expertise, including, but not limited to:

- American Red Cross
- Center for Disease Control
- FEMA
- Kansas Adjutant General's Office
- Kansas Department of Agriculture, the Kansas Department of Health and Environment
- Kansas Department of Transportation
- Kansas Fire Service, Kansas Water Office

- Kansas Geological Survey
- Kansas State Fire Marshall
- Local and county planning and zoning offices (where available).
- Local business and non-profit entities
- National Oceanic and Atmospheric Administration
- National Weather Service
- Nuclear Regulatory Commission
- Pipeline and Hazardous Materials Safety Administration
- Salvation Army
- United States Army Corp of Engineers, National Resource Conservation Service
- United States Department of Agriculture
- United States Geological Survey

2.6 – Public Participation

44 CFR Requirement 201.6(b): 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

As part of the overall planning process, the public were provided with numerous opportunities to contribute and comment on the creation and adoption of the plan. These opportunities included:

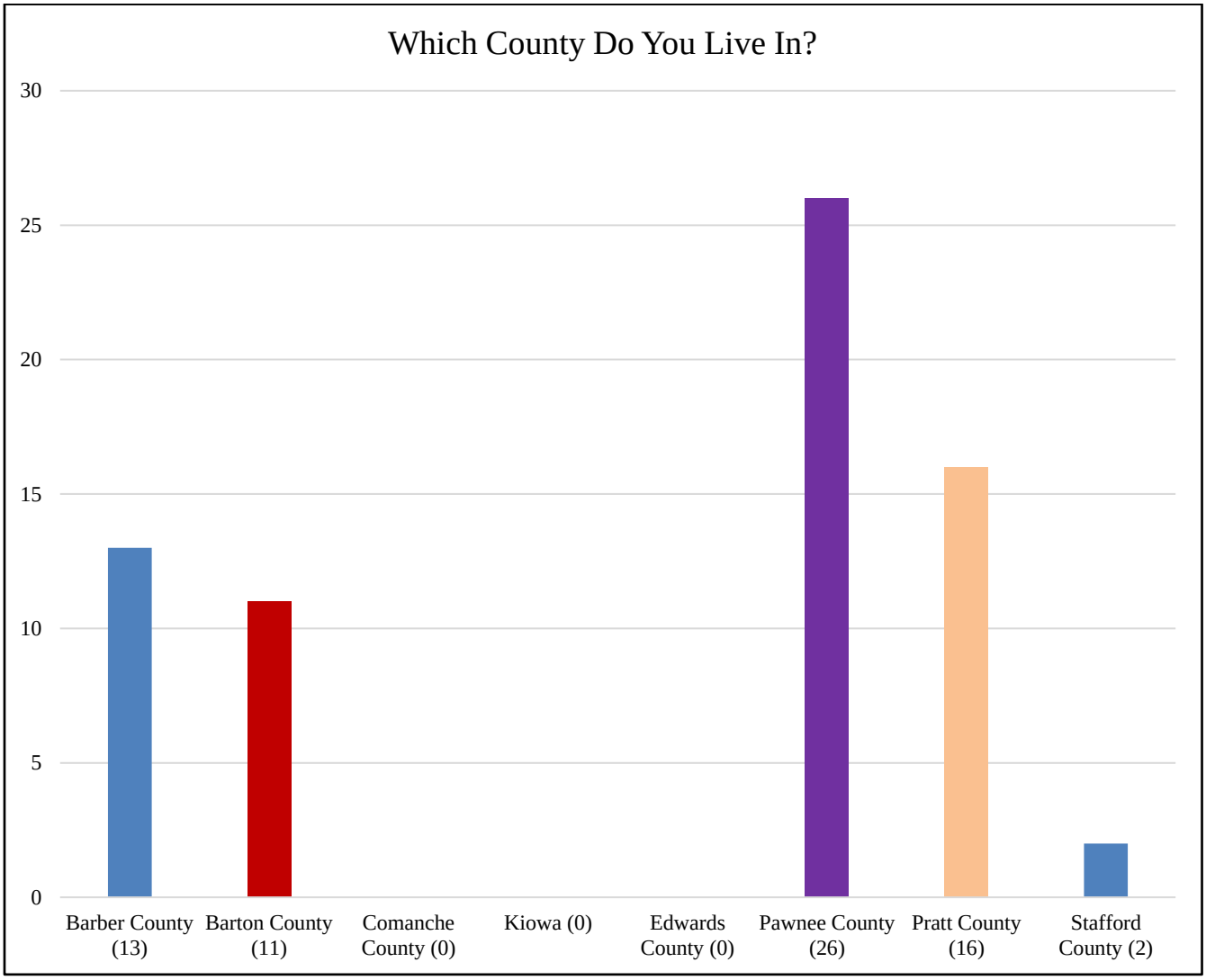
- Advertised meeting invitations on participating jurisdictional websites
- Open meeting opportunities with Kansas Region E MPC members
- Access to an online survey document to provide feedback
- Comment period upon completion of draft plan

Input from the general public provided the MPC with a clearer understanding of local concerns, increased the likelihood of citizen buy-in concerning proposed mitigation actions, and provided elected officials with a guide and tool to set regional ordinances and regulations. This public outreach effort was also an opportunity for adjacent jurisdictions and entities to be involved in the planning process.

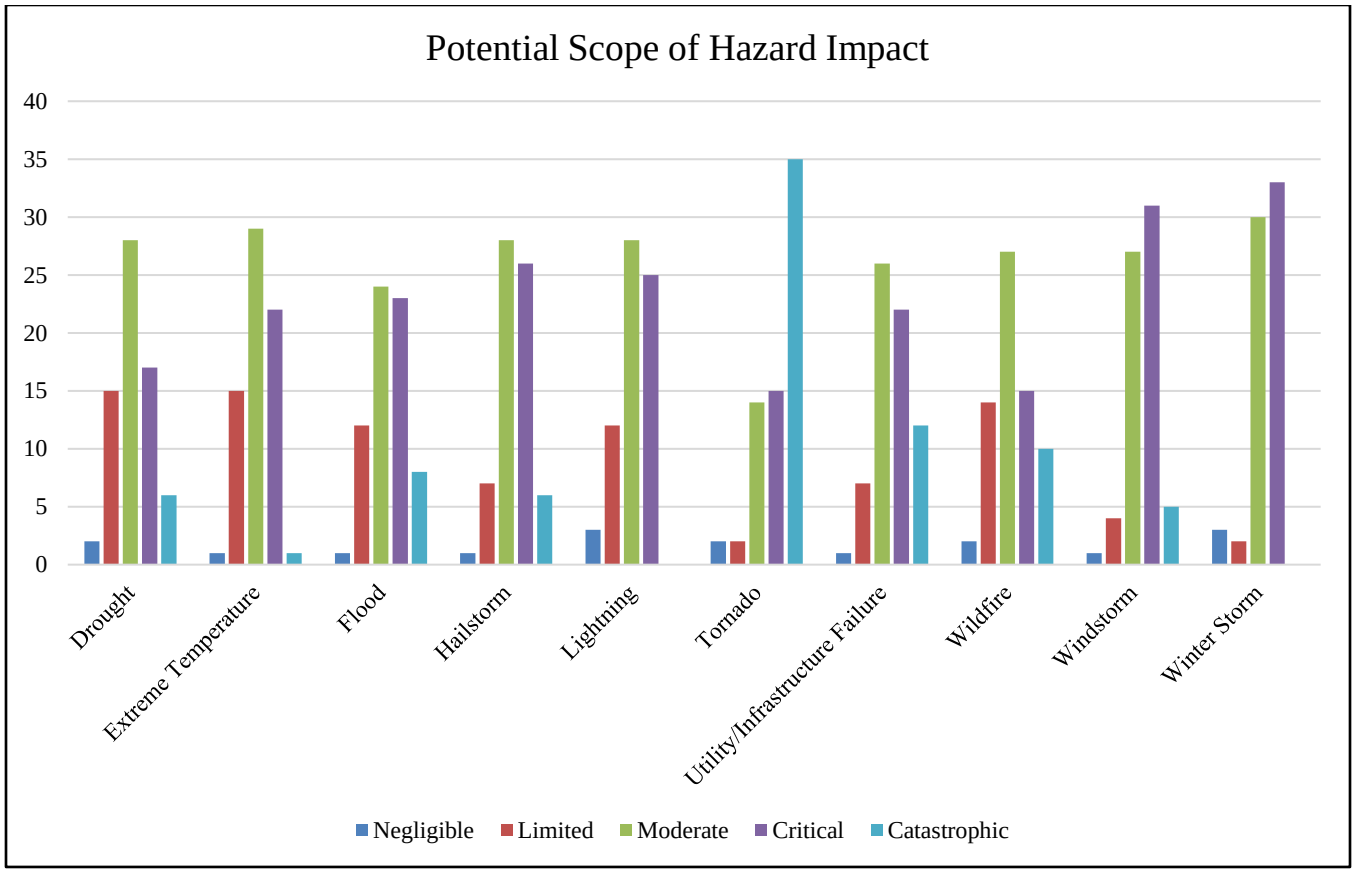
Additionally, as citizens were made more aware of potential hazards and the local process to mitigation against their impacts, it was believed that they would take a stronger role in making their homes, neighborhoods, schools, and businesses safer from the potential effects of natural hazards.

The following graphics represents the feedback received from the public from the online survey document (68 participants).

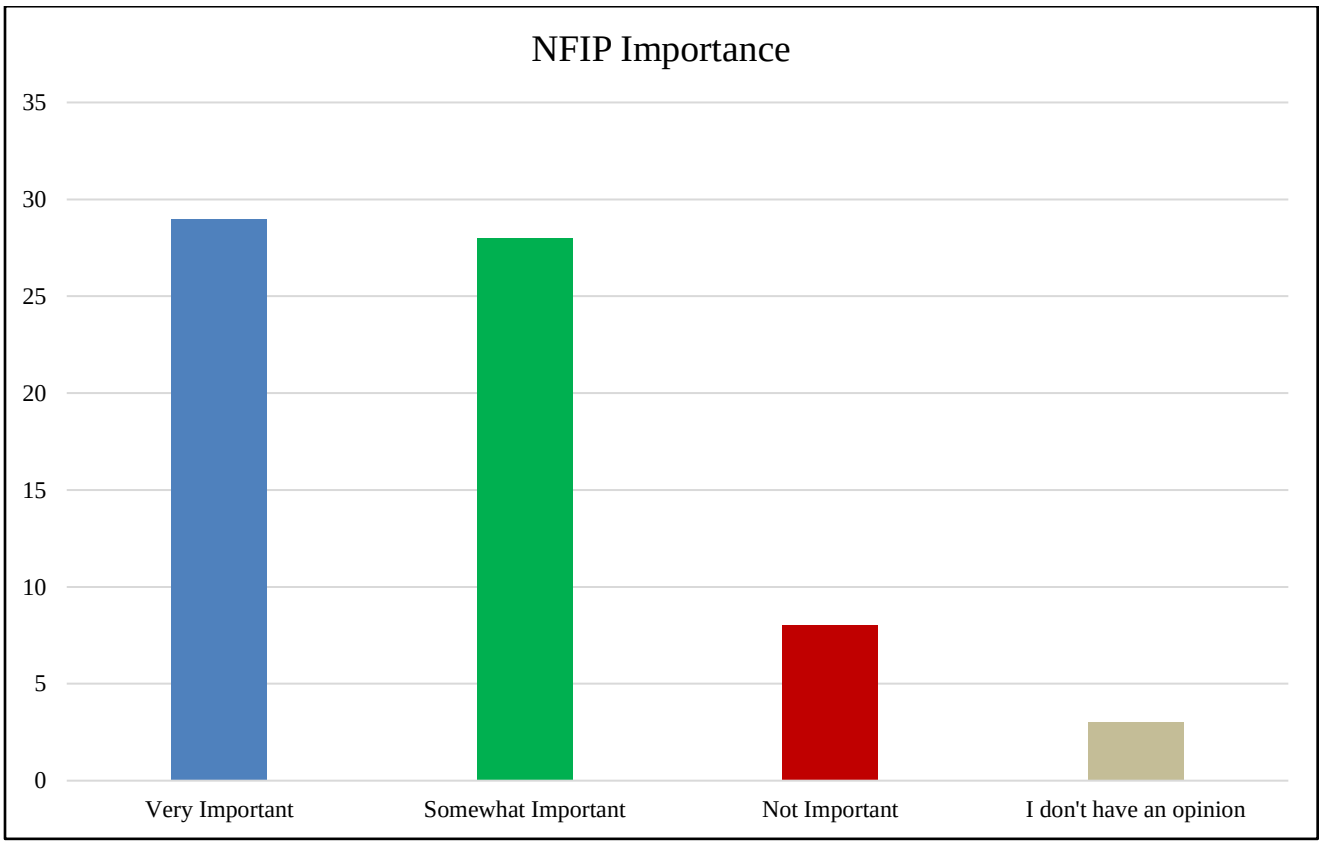
Question 1: In which county or jurisdiction do you live?



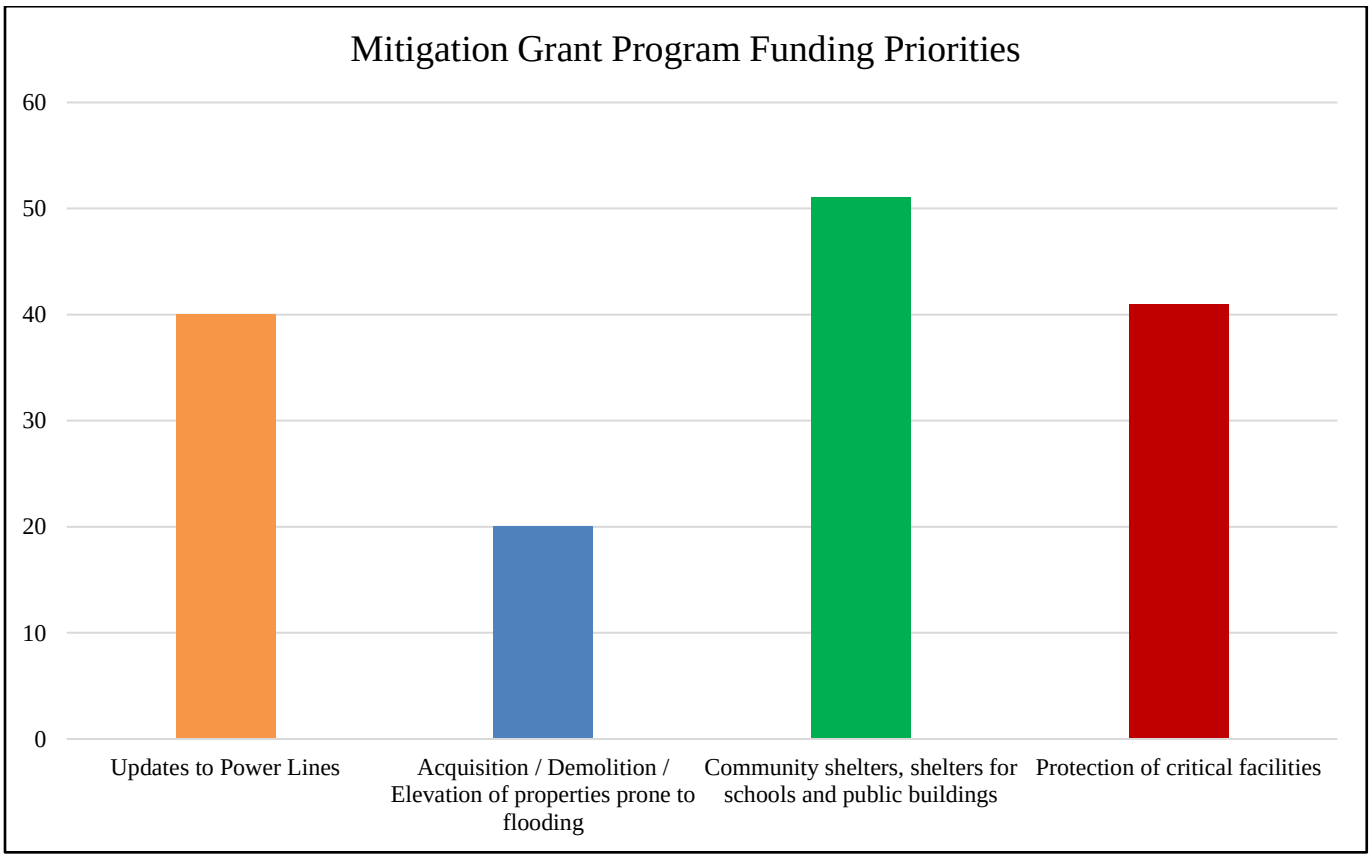
Question 2: In 2014, the Region consisting of Barber, Barton, Comanche, Edwards, Kiowa, Pawnee, Pratt, and Stafford counties, the planning committee determined that the hazards listed below are important to the area. Indicate the level of risk, or the scope of potential impacts, in the Region, that you perceive for each hazard:



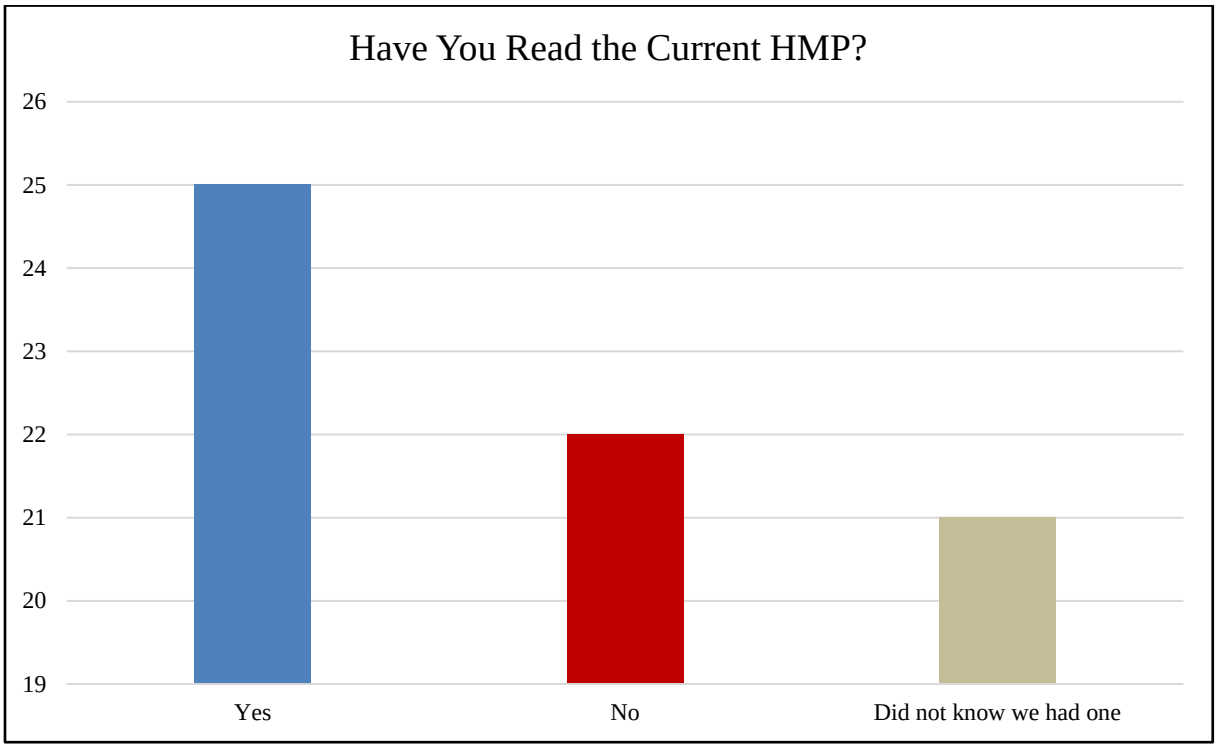
Question 3: In the Region, the planning committee has determined that a flood event is the third most critical hazard. How important is it for you to have your community participate in or continue to participate in the National Flood Insurance Program?



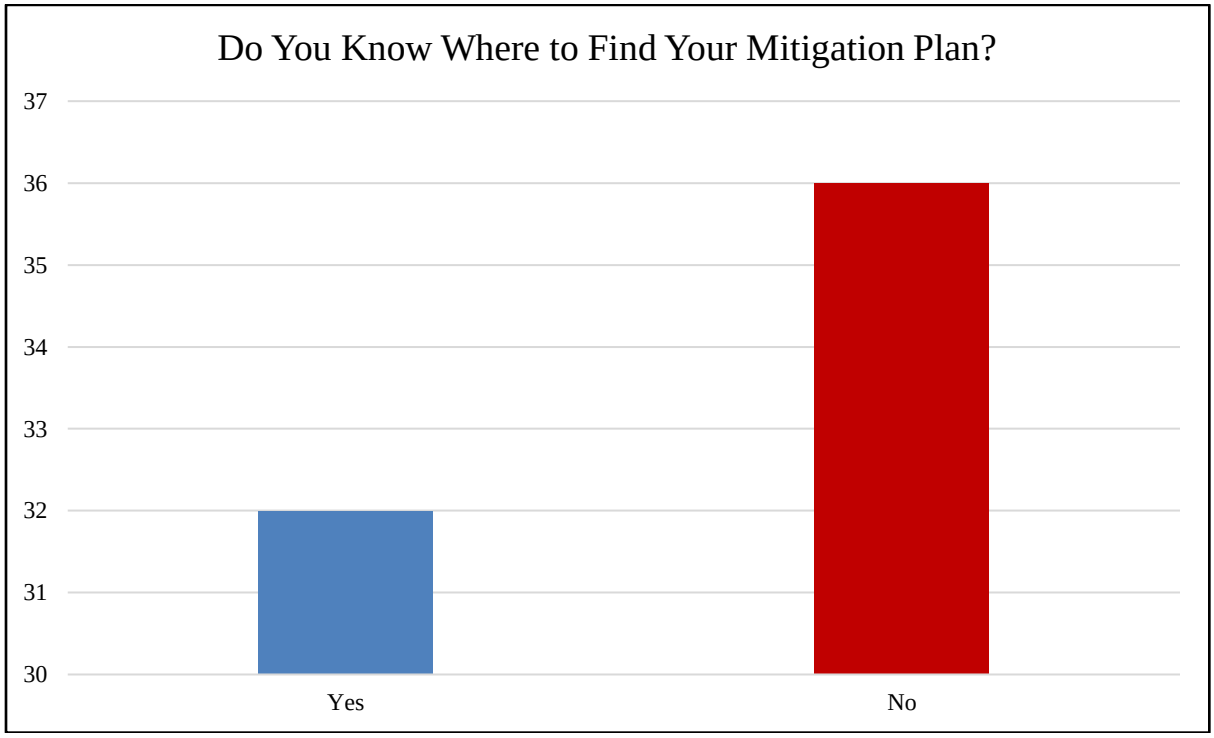
Question 4: The Kansas Division of Emergency Management currently reviews the application for funds for the FEMA Risk Mitigation Grant Program. Your current funding priorities are listed below. Please check those that could benefit your community.



Question 5: Have you had the opportunity to read your current Risk Mitigation Plan?



Question 6: Do you know where you can find the mitigation plan for your county if you would like to see it?



In addition, respondents were given the opportunity to address any local concerns or issues of concern to them.

Question 7: Your opinion is valuable to this planning process. Discuss any other problems that the planning committee should consider when developing a strategy to reduce future losses caused by natural hazard events.

Table 2.10: Kansas Region E Survey Comments, Areas of Concern

Jurisdiction	Comments
Barton County	Water is the main concern as homeowner policies typically do not cover. Any work that could be done to mitigate homeowner & business loss is a must. Ditches and culverts need regular maintenance and serious repair. Roads need better drainage plans. Runoff onto other's property is not a plan. Do not waste funds by giving the money to the Utility companies or towards building shelters that people will not use.
Barber County	Safety upgrades and money for the schools
Barton County	It would be helpful to have real time radio communications available to the public during natural hazards events, "one place to tune in" for current information.
Barton County	shelters for public to go to for storms
Barton County	Mass casualty from tornado
Barton County, Buffalo Township	Lack of places to shelter from tornado if away from home. Great Bend doesn't seem to have public shelters any more.
Barton County, Great Bend Township.	I'd really like to get rid of the wind turbine parts and pieces that are being stored in Barton & Pawnee Counties. Imagine the catastrophic damage to our communities should those get tossed around in a tornado. They create little to no revenue for the taxpayers and pose a serious risk to us all in the event of damaging winds and tornadoes.
Pawnee County	Interaction between fed/state/ local authorities needs to be fine-tuned and communication needs to be clearer. Many townships fail to recognize importance of reporting disaster data and don't report until last minute or when it's too late. Federal / state EM sets up meeting and then wants to cancel at least minute?
Pawnee County	More planning and awareness of COOP plans.
Pawnee County	We need more flood reconstruction/mold mitigation companies in the area, we need insurance agents to be more proactive to customers experiencing flooding events, we need more resources to HELP FAMILIES DISPLACED BY FLOODING/ MOLD.
Pawnee County	Make sure we have upgraded systems
Pawnee County	The city has been wonderful to pick up limbs, work on utilities and help out in times of need. I appreciate the willingness to help!!
Pawnee County	Battery back-up for town sirens that do not have them.
Pawnee County	animal safety and evacuation. People will not leave without their animals.
Pawnee County, Garfield	Better drainage so less flooding
Pawnee County, Larned	Man-made hazards, either intentional or not.
Pratt County	I don't know if this is the responsibility of this committee, but I feel tornado shelters for the schools are important.

Table 2.10: Kansas Region E Survey Comments, Areas of Concern

Jurisdiction	Comments
Pratt County	Those who don't have shelter, elder, handicap, flooding issues, the fact we are isolated from urban centers and notification of events doesn't reach us due to more dependence on cell phones,
Pratt County, Sawyer	Maintaining highways so they don't gather water/snow during storms.

Question 8: Do you have any mitigation project that you would like to see implemented and what are they?

Table 2.11: Kansas Region E Survey Comments, Requested Projects

Jurisdiction	Comments
Barton County, Precinct 3 Ward 2	City of Great Bend needs to reduce amount of storm drains that drains into Veteran's Lake. There are too many subdivisions that drain to the area creating potential flood risk.
Barber County	Water and power lines
Barton County	Federal funding should be allocated to the City of GB for much needed culvert and ditch repairs as well the implementation of storm water disposal systems in areas of town where they are completely absent or in need of serious repair or highly deficient. Tenth street floods when a Suchy Lake backs up. Amber Meadows and the Stoneridge addition lack storm water disposal systems. Veterans Lake has been a flooded disaster increasing the risk of illness in the community. The County needs to support GB in fixing these issues as GB is the largest tax contributor in the county.
Barton County	Mitigation for farm chemical, anhydrous ammonia spill in city limits of Larned
Barton County, Buffalo Township	Better storm warning, lack of local television and radio broadcast when local regions are affected.
Barton County, Great Bend Township.	Clearing of dead trees to reduce wildfire risk.
Pawnee County	update plans and give copies to all involved so we have info handy if something does happen
Pawnee County	storm shelters at schools, are we not learning from Oklahoma disaster?
Pawnee County	Battery back-up for city siren and community shelter in case of tornado.
Pawnee County, Garfield	Fix ditches in Garfield to prevent flooding
Pratt County	Shelter for the elderly, those without basements, and handicap.
Pratt County, Pratt	After the Greensburg tornado there appeared to be two large deficits. Infrastructure that was destroyed and the lack of predefined resources.
Stafford County	Prevention... culverts along county roads. There are many area ditches retaining large amounts of water. No culverts to move it along. It is backed up into fields and pastures causing fencing issues.

2.7 – Planning Meetings

Within Kansas Region E there are many jurisdictions and organizations who have a vested interest in participating in the creation and adoption of the hazard mitigation plan. An integral part of the planning process included the identification, development, and coordination of all of these entities. As such, a series of three organizational and planning meetings were scheduled and all past and potential future

participants were notified by the State of Kansas as to the dates and locations of the meetings. In addition, communities neighboring the region were invited to participate in the planning process.

It is worth noting that all neighboring Kansas counties are undergoing a similar mitigation planning effort, and as part of this statewide process all county and state planners are working together toward common mitigation goals. During the creation and adoption of this plan communication channels were opened to facilitate the cross pollination of ideas, to incorporate neighboring regions concerns, and to ensure the overall preparedness of the State of Kansas.

A series of kick-off meetings were held with MPC members, available representatives from jurisdictions within the planning region, local and regional stakeholders, and the public invited. At the kickoff meeting, the planning process, project coordination, scope, participation requirements, strategies for public involvement, and schedule were discussed in detail. During the meeting, participants were led through a guided discussion concerning hazard data sourced from their previous hazard mitigation plans. Additionally, research was conducted prior to the meeting on recent regional hazard events to further inform the discussion. Participants were encouraged to discuss past hazard events, past impacts, and the future probability for all identified hazards. At the conclusion of the meeting, all participants were provided with a data collection forms to solicit information needed to properly complete the HMP. The forms asked for information concerning data on historic hazard events, at risk populations and properties, and available capabilities. Additionally, participating jurisdictions were provided with their mitigation actions from the previous plans for review and comment and asked to identify any additional mitigation actions.

A mid-term planning meeting was held with MPC members. Based upon the initial research, discussions held during the kickoff meetings, information obtained from the data collection forms, additional research, and subsequent discussion with MPC members, the results of the hazard identification, classification, and delineation were discussed in detail. In addition, sections of the HMP were made available for review and comment. Based on the supplied hazard information, participants were asked to assist in the development and review of mitigation goals and actions.

A final planning meeting was held with MPC members, available representatives from jurisdictions within the planning region, local and regional stakeholders, and the public invited. The completed draft HMP was made available for review and comment.

The following table presents the date and location of each planning meeting.

Table 2.12: Kansas Region E Planning Meetings

Meeting Number	Date	Location
1 (Kickoff)	05/23/2019	Pawnee County
	05/24/2019	Pratt County
2 (Mid-Term)	08/21/2019	Pratt County
3 (Final)	11/06/2019	Pratt County
	11/06/2019	Barton County

Both the minutes and sign-in sheets from all meetings may be found in Appendix C.

2.8 – Existing Plan Incorporation

44 CFR 201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

The hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various other jurisdictional plans. In creating this plan, all the planning documents identified below were consulted and reviewed, often extensively. In turn, when each of these other plans is updated, they will be measured against the contents of the hazard mitigation plan.

Below is a list of the various planning efforts, sole or jointly administered programs, and documents reviewed and included in this hazard mitigation plan. While each plan can stand alone, their review and functional understanding was pivotal in the development of this plan and further strengthens and improves Kansas Region E's resilience to disasters.

- All participating jurisdictions Codes and Ordinances
- All participating jurisdictions Comprehensive Plans
- All participating jurisdictions Critical Facilities Plans
- All participating jurisdictions Economic Development Strategic Plans
- All participating jurisdictions Emergency Operations Plans
- All participating jurisdictions Flood Mitigation Assistance Plan
- All participating jurisdiction Land-Use Plans
- Community Wildfire Protection Plans
- Any other newly created or relevant jurisdictional plan

Information from each of these plans and programs is utilized within the applicable hazard sections to provide data and fully inform decision making and prioritization.

State and Federal Level Plan Integration

The following list illustrates local, state and federal programs integrated, where applicable, and referenced in Kansas Region E's mitigation efforts.

- State of Kansas Hazard Mitigation Plan
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program
- National Flood Insurance Program
- Pre-Disaster Mitigation Program
- Repetitive Loss & Severe Repetitive Loss Program
- FireWise Communities Program
- Relevant Dam Emergency Action Plans (if document not secured)
- Community Rating System
- 2015 Cow Creek Watershed Flood Mapping Project

Integration Challenges

The 2014 plan update successfully integrated approved Kansas Region E local hazard mitigation plans into one regional HMP. This represents a success of our streamlined program of allowing jurisdictions to participate in multi-jurisdictional regional-level plans. This program not only reduces the cost and the burden to local jurisdictions, it also allows for closer collaboration and integration of local communities in all areas or planning and response. However, and as always, challenges exist due to the day to day demands of the working environment, including scheduling conflicts, budget restrictions, and staffing changes and shortages related to both the utilization and incorporation of the HMP and completion of identified hazard mitigation projects.

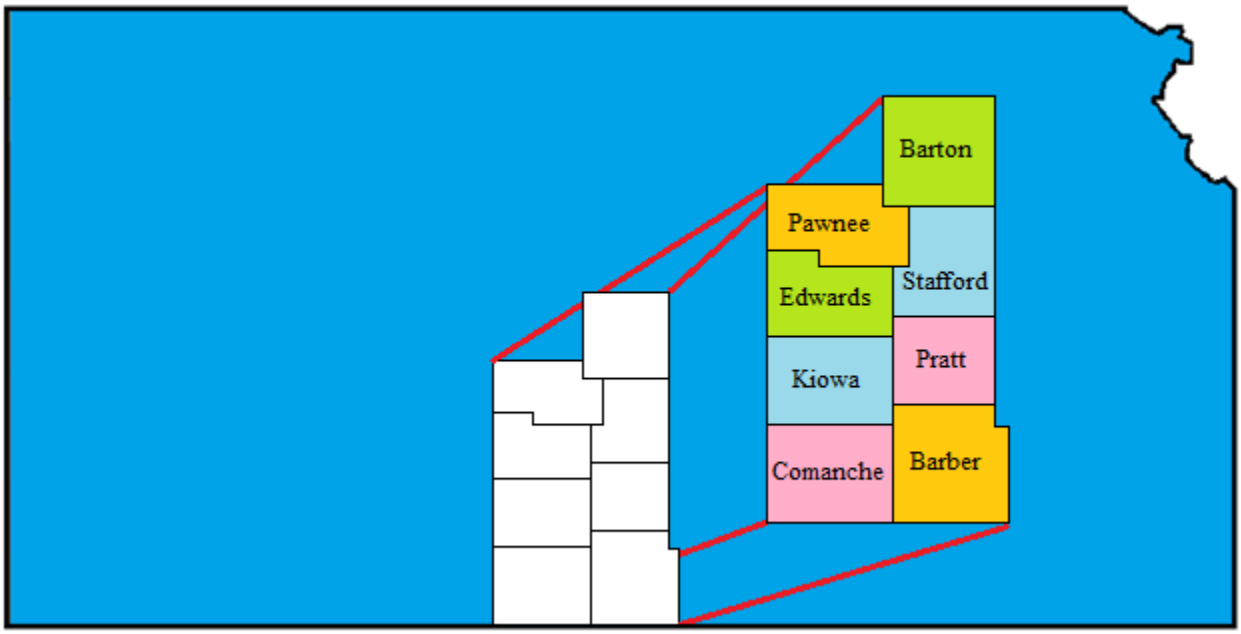
3.0 Planning Area

3.1 – Introduction

Kansas Region E consists of the following seven participating counties and their participating jurisdictions:

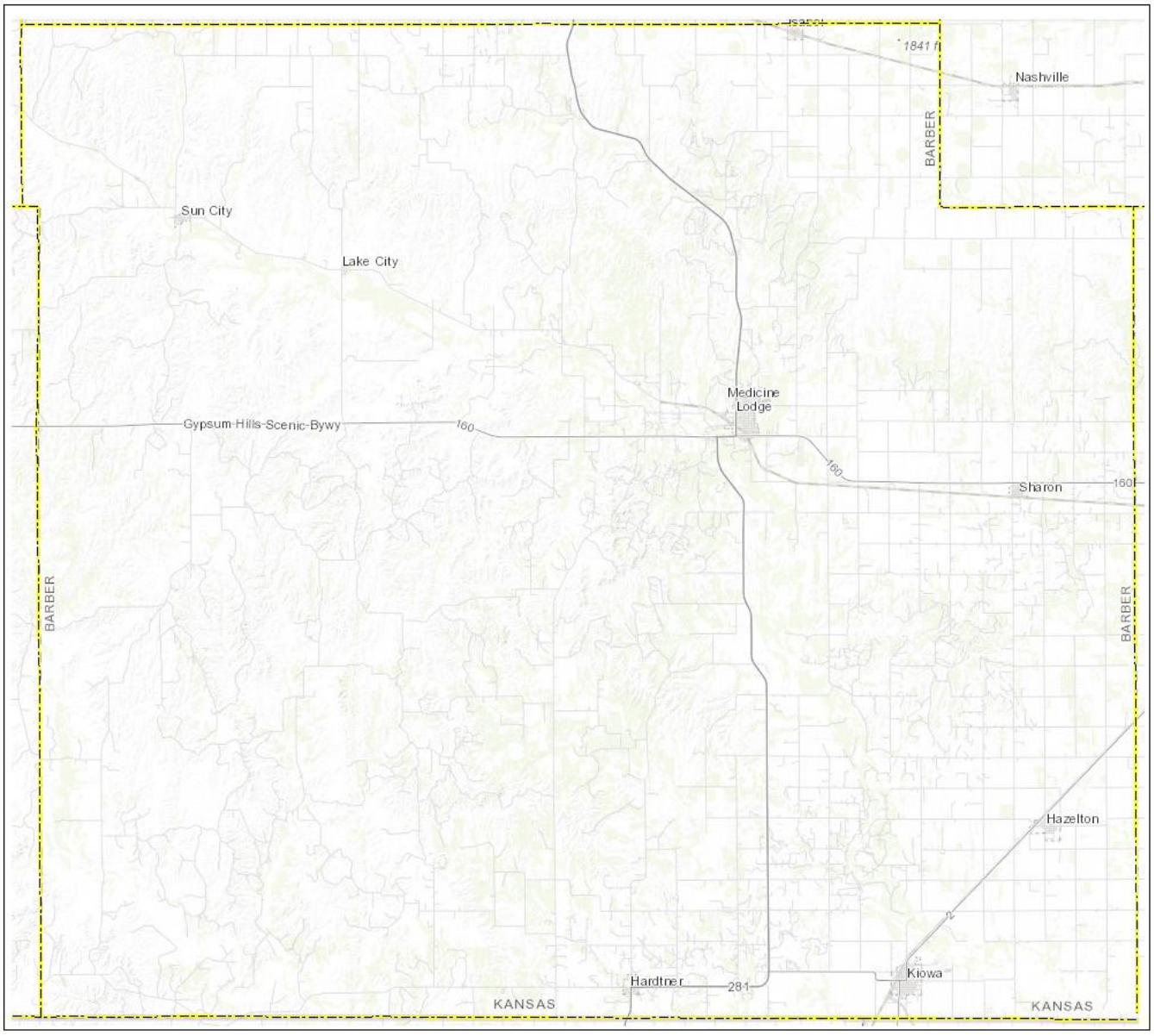
- Barber County
- Barton County
- Comanche County
- Edwards County
- Kiowa County
- Pawnee County
- Pratt County
- Stafford County

The following map details the locations of these counties.



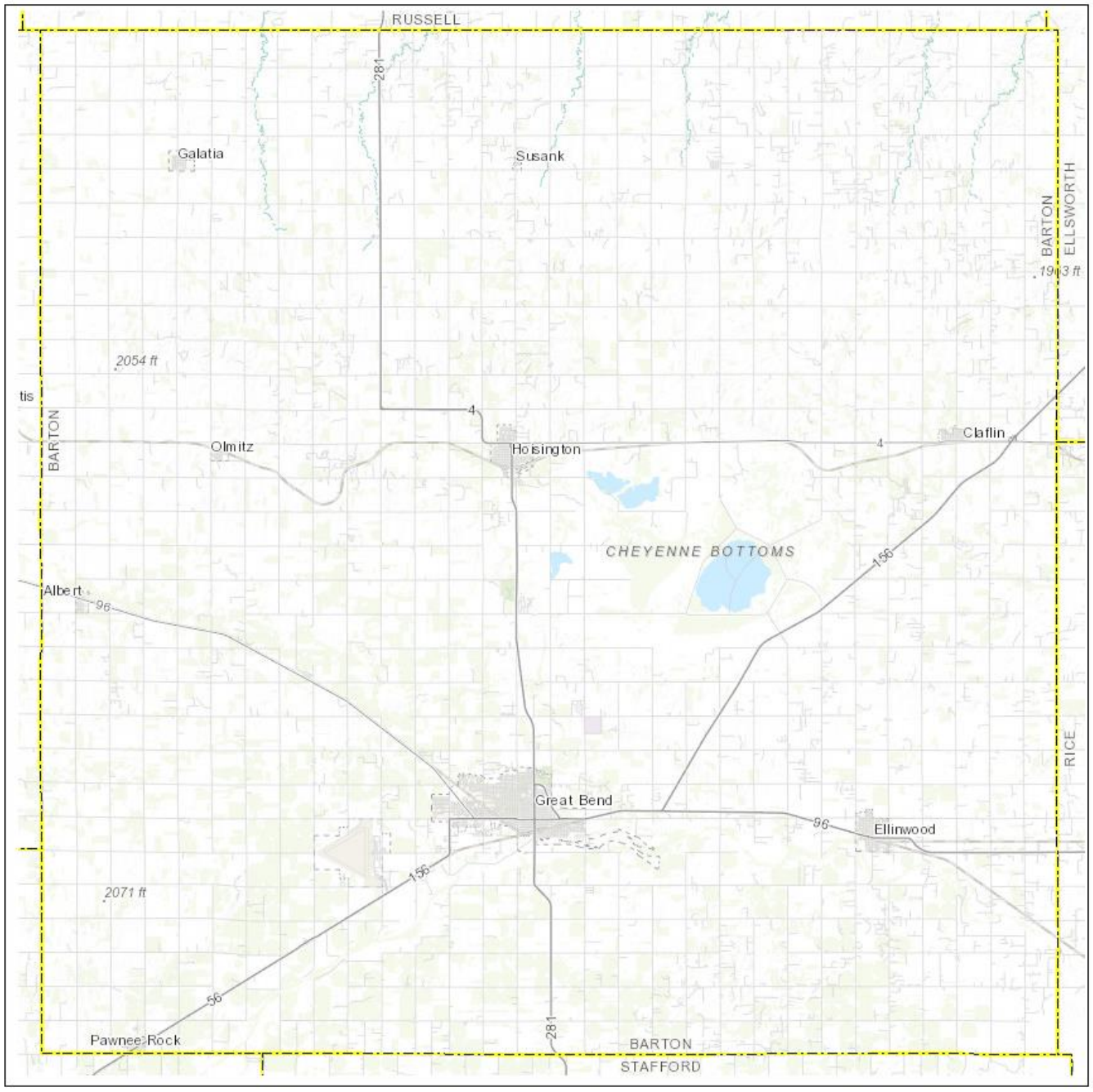
The following map, provided by the Kansas Department of Transportation (KDOT), detail the locations of participating jurisdictions for Barber County:

Barber County



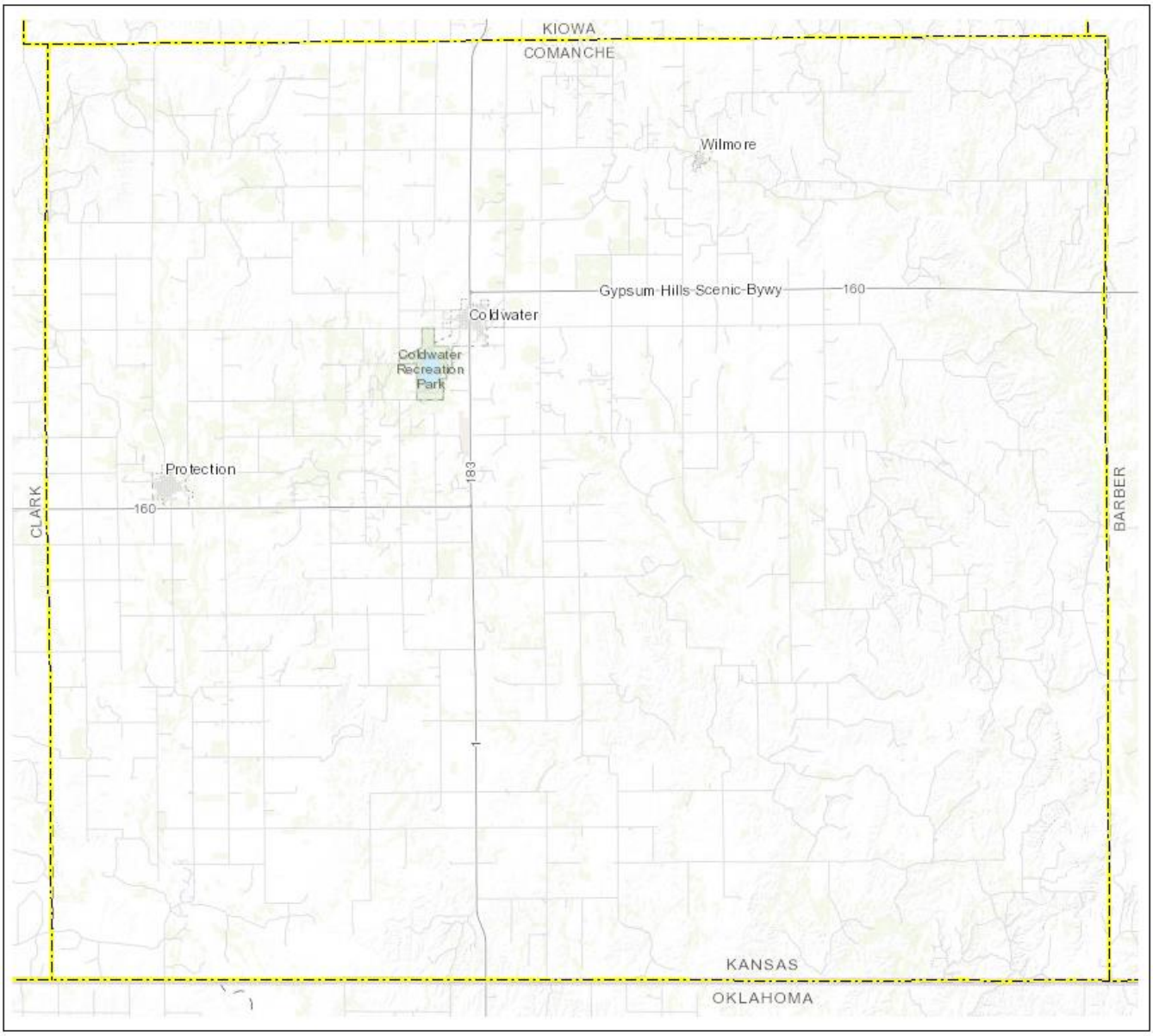
The map following map, provided by KDOT, details the locations of participating jurisdictions for Barton County:

Barton County



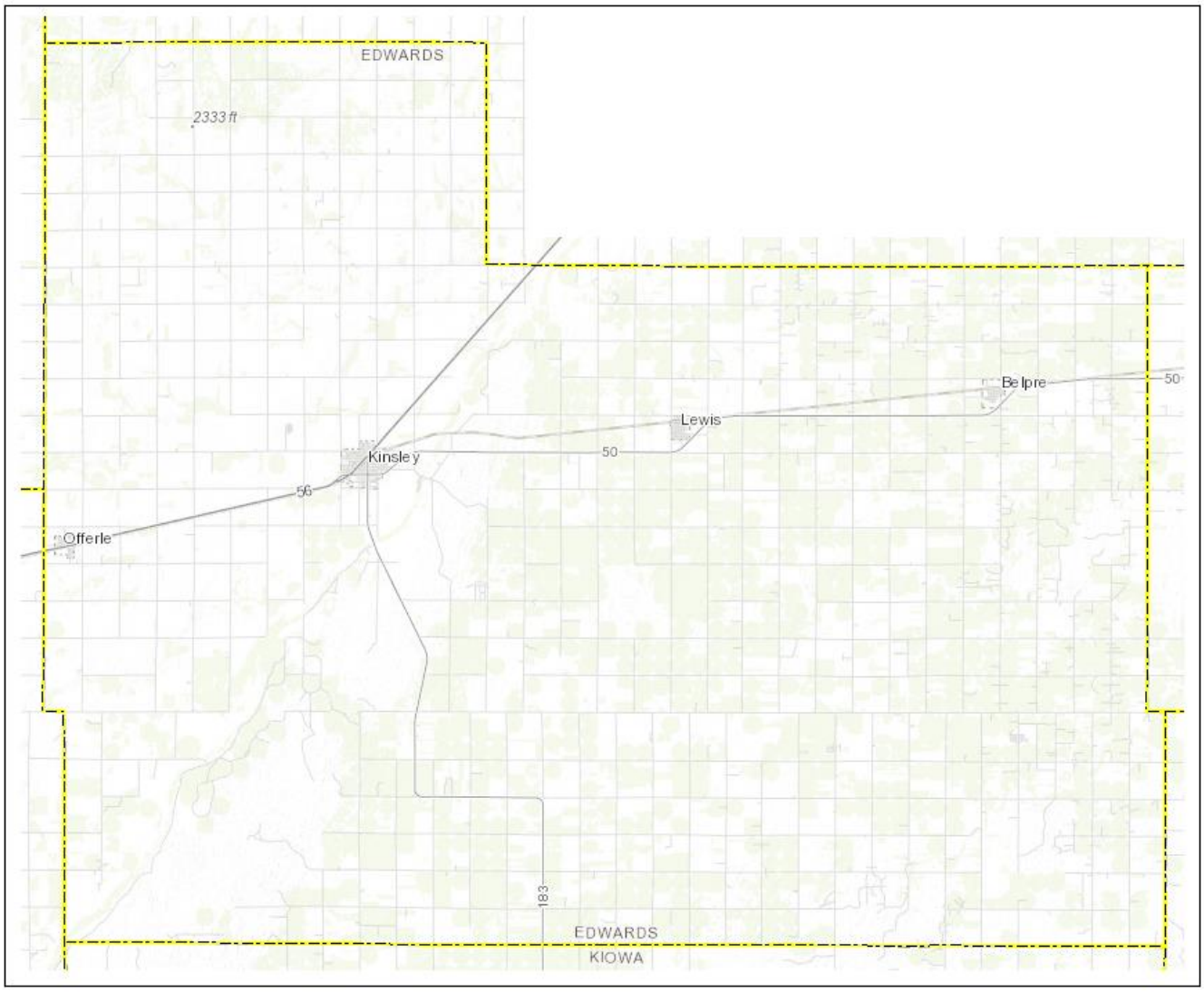
The map following map, provided by KDOT, details the locations of participating jurisdictions for Comanche County:

Comanche County



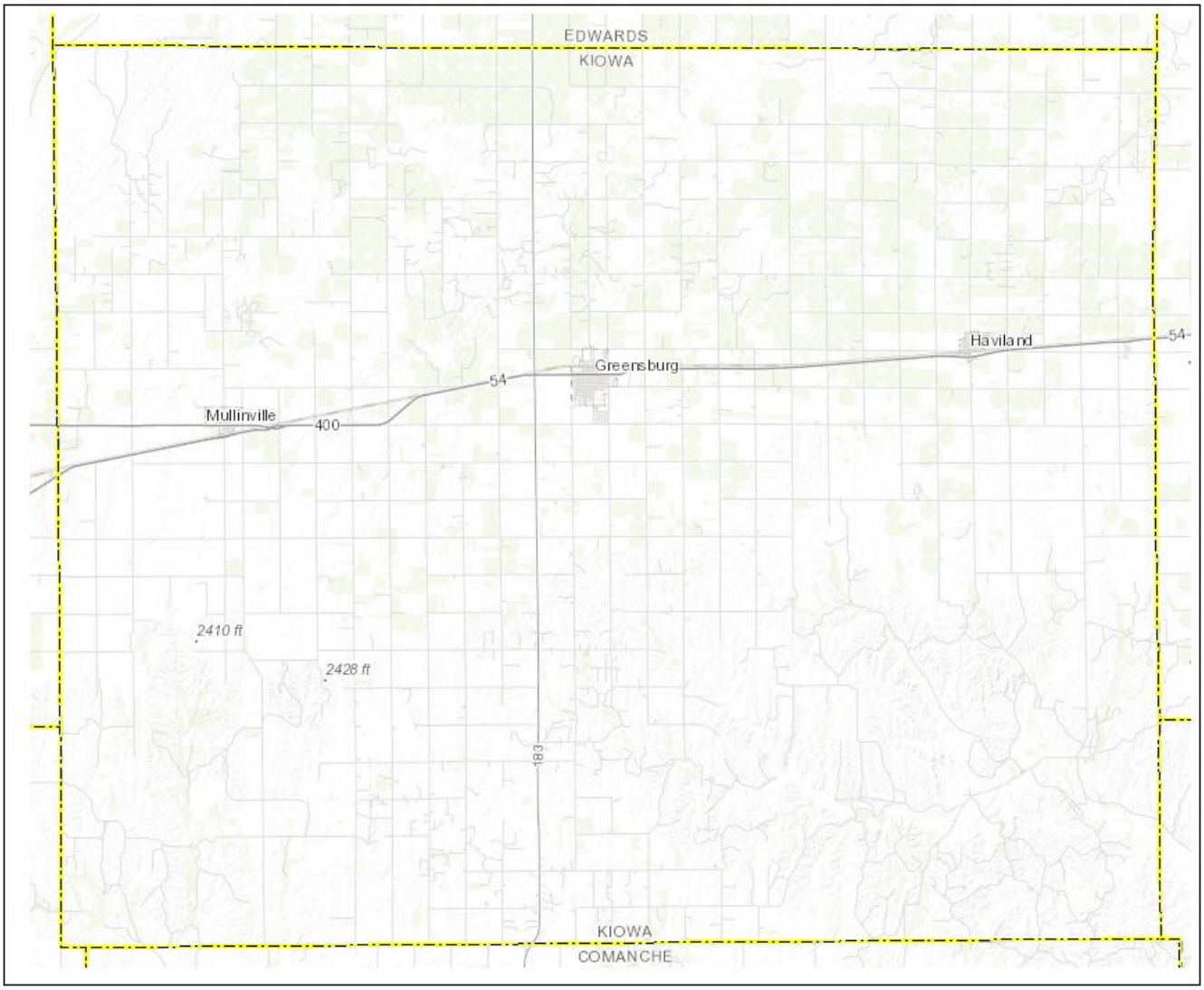
The map following map, provided by KDOT, details the locations of participating jurisdictions for Edwards County:

Edwards County



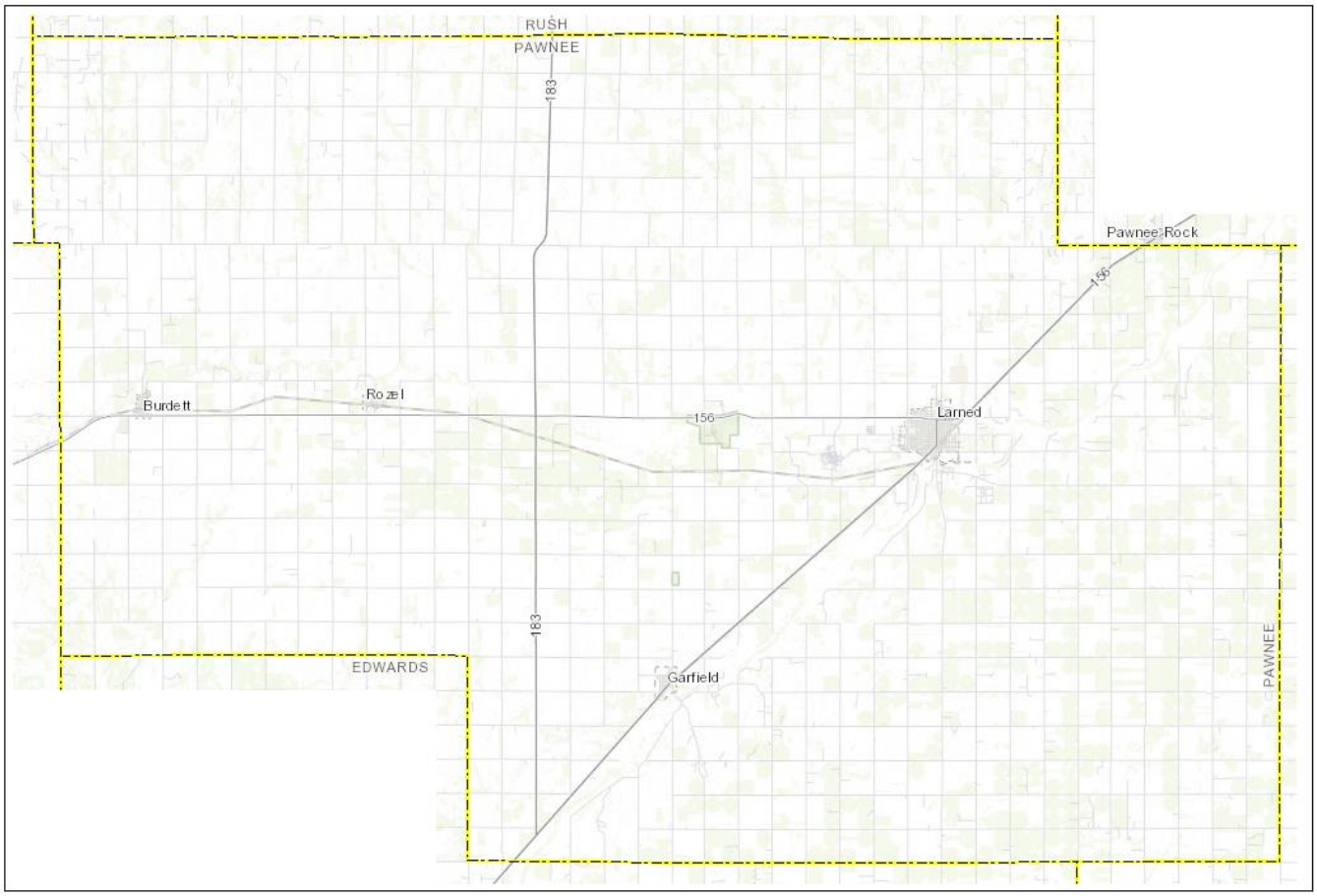
The map following map, provided by KDOT, details the locations of participating jurisdictions for Kiowa County:

Kiowa County



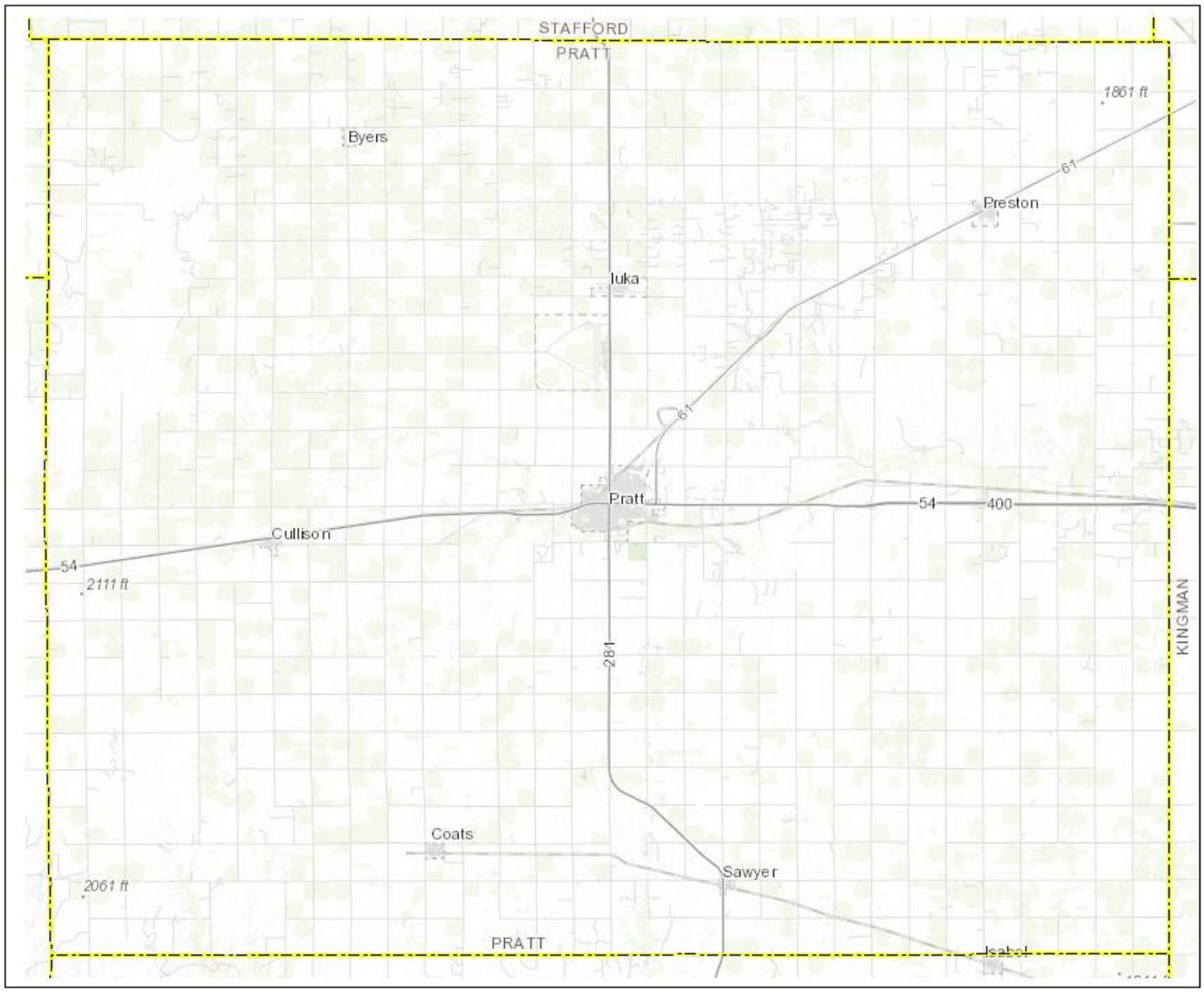
The map following map, provided by KDOT, details the locations of participating jurisdictions for Pawnee County:

Pawnee County



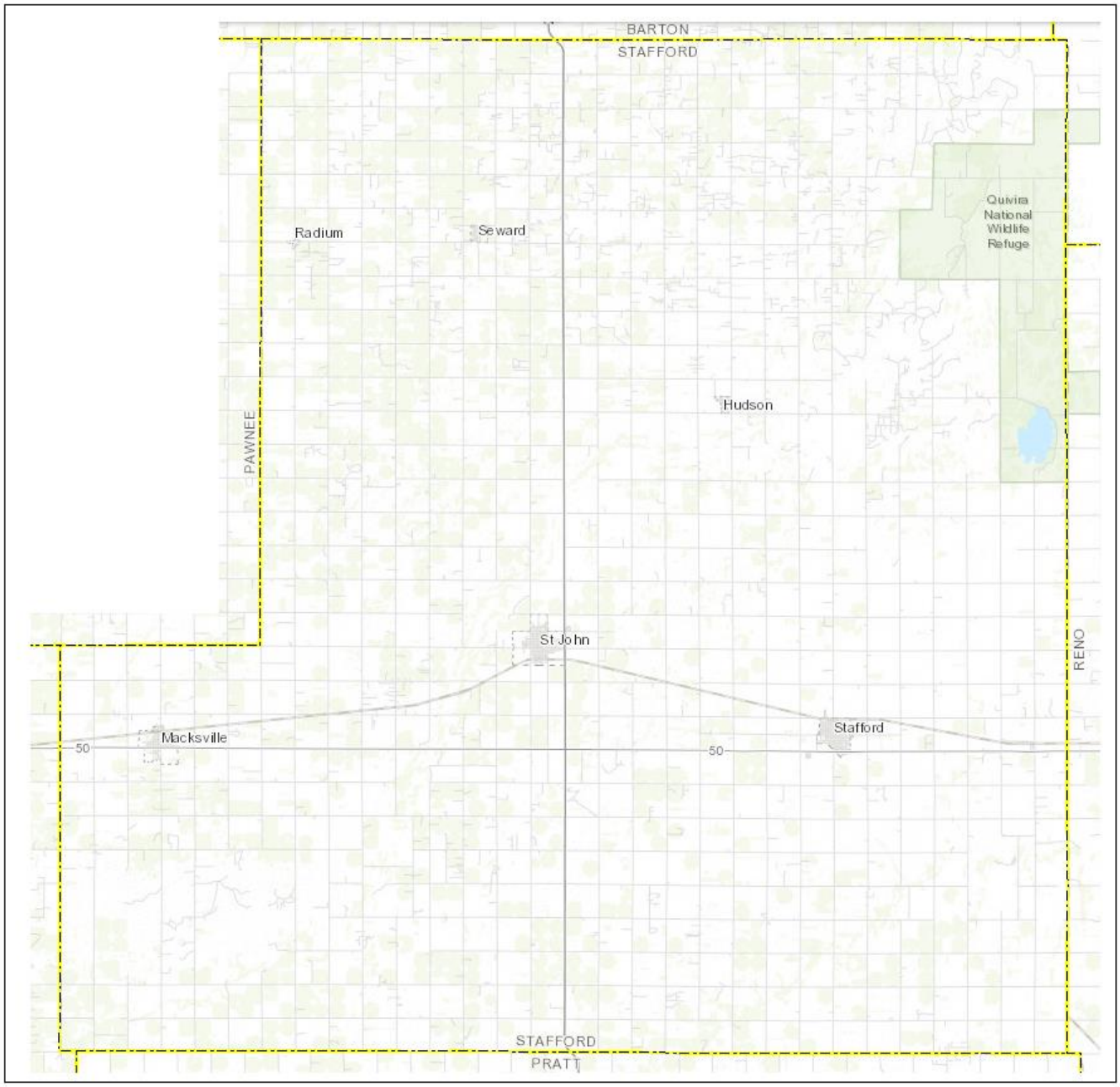
The map following map, provided by KDOT, details the locations of participating jurisdictions for Pratt County:

Pratt County



The map following map, provided by KDOT, details the locations of participating jurisdictions for Stafford County:

Stafford County



3.2 – Regional Population Data

The following tables present population data for counties and participating city jurisdictions in Kansas Region E. In general, the higher a jurisdiction's population the greater the potential vulnerability of its citizens to identified hazards.

Table 3.1: Barber County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Barber County	5,307	4,861	4,472	-835	-15.7%	4
City of Hardtner	199	172	158	-41	-20.6%	527
City of Hazelton	144	93	85	-59	-41.0%	149
City of Isabel	108	90	82	-26	-24.1%	328
City of Kiowa	1,055	1,026	941	-114	-10.8%	888
City of Medicine Lodge	2,193	2,009	1,854	-339	-15.5%	1,545
City of Sharon	210	158	145	-65	-31.0%	500
City of Sun City	81	53	48	-33	-40.7%	320

Source: US Census Bureau

Of note for Barton County and its participating jurisdictions for the period 2000 to 2018:

- A population decline was noted in Barton County, -15.7% as a whole
- Population declines were noted in all participating cities

Table 3.2: Barton County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Barton County	28,205	27,674	26,111	-2,094	-7.4%	29
City of Albert	181	175	166	-15	-8.3%	692
City of Claflin	705	645	612	-93	-13.2%	1,855
City of Ellinwood	2,164	2,131	1,969	-195	-9.0%	1,823
City of Galatia	61	39	37	-24	-39.3%	100
City of Great Bend	15,345	15,995	15,170	-175	-1.1%	1,412
City of Hoisington	2,975	2,706	2,510	-465	-15.6%	2,127
City of Olmitz	138	114	107	-31	-22.5%	629
City of Pawnee Rock	356	252	233	-123	-34.6%	832
City of Susank	57	34	32	-25	-43.9%	356

Source: US Census Bureau

Of note for Barton County and its participating jurisdictions for the period 2000 to 2018:

- A population decline was noted in Barton County, -7.4% as a whole
- Population declines were noted in all participating cities

Table 3.3: Comanche County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Comanche County	1,967	1,891	1,748	-219	-11.1%	2
City of Coldwater	792	828	759	-33	-4.2%	289
City of Protection	558	514	475	-83	-14.9%	500
City of Wilmore	57	53	48	-9	-15.8%	240

Source: US Census Bureau

Of note for Comanche County and its participating jurisdictions for the period 2000 to 2018:

- A population decline was noted in Comanche County, -11.1% as a whole
- Population declines were noted in all participating cities

Table 3.4: Edwards County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Edwards County	3,449	3,037	2,849	-600	-17.4%	5
City of Belpre	104	84	84	-20	-19.2%	205
City of Kinsley	1,658	1,457	1,376	-282	-17.0%	1,067
City of Lewis	486	451	423	-63	-13.0%	1,282
City of Offerle	220	199	187	-33	-15.0%	719

Source: US Census Bureau

Of note for Edwards County and its participating jurisdictions for the period 2000 to 2018:

- A population decline was noted in Edwards County, -17.4% as a whole
- Population declines were noted in all participating cities

Table 3.5: Kiowa County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Kiowa County	3,278	2,553	2,516	-762	-23.2%	3
City of Greensburg	1,574	777	791	-783	-49.7%	531
City of Haviland	612	701	683	71	11.6%	1,453
City of Mullinville	279	255	246	-33	-11.8%	410

Source: US Census Bureau

Of note for Kiowa County and its participating jurisdictions for the period 2000 to 2018:

- A population decline was noted in Kiowa County, -23.2% as a whole
- Population declines were noted in all participating cities, with the exception of Haviland

Table 3.6: Pawnee County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Pawnee County	7,233	6,973	6,562	-671	-9.3%	9
City of Burdett	256	247	228	-28	-10.9%	912
City of Garfield	198	190	175	-23	-11.6%	324
City of Larned	4,236	4,054	3,772	-464	-11.0%	1,626
City of Rozel	182	156	143	-39	-21.4%	650

Source: US Census Bureau

Of note for Pawnee County and its participating jurisdictions for the period 2000 to 2018:

- A population decrease was noted in Pawnee County, -9.3% as a whole
- Population declines were noted in all participating cities

Table 3.7: Pratt County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Pratt County	9,647	9,656	9,378	-269	-2.8%	13
City of Byers	50	35	34	-16	-32.0%	189
City of Coats	112	83	77	-35	-31.3%	385
City of Cullison	98	101	99	1	1.0%	550
City of Iuka	185	163	160	-25	-13.5%	262
City of Pratt	6,570	6,835	6,630	60	0.9%	879
City of Preston	164	158	148	-16	-9.8%	315
City of Sawyer	124	124	132	8	6.5%	1,015

Source: US Census Bureau

Of note for Pratt County and its participating jurisdictions for the period 2000 to 2018:

- A population decrease was noted in Pratt County, -2.8% as a whole
- Population declines were noted in all participating cities, with the exception pf the City of Pratt which relatively remained static

Table 3.8: Stafford County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Stafford County	4,789	4,437	4,178	-611	-12.8%	5
City of Hudson	133	129	124	-9	-6.8%	954
City of Macksville	514	549	532	18	3.5%	532

Table 3.8: Stafford County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
City of Radium	40	25	23	-17	-42.5%	575
City of Seward	63	64	63	0	0.0%	252
City of St. John	1,318	1,295	1,188	-130	-9.9%	660
City of Stafford	1,161	1,042	956	-205	-17.7%	1,017

Source: US Census Bureau

Of note for Stafford County and its participating jurisdictions for the period 2000 to 2018:

- A population decrease was noted in Stafford County, -12.8% as a whole
- Population declines were noted in all participating cities, with the exception of Macksville

3.3 – At-Risk Population Data

The National Response Framework defines at-risk populations as "populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining independence, communication, transportation, supervision, and medical care."

In general, at risk populations may have difficulty with medical issues, poverty, extremes in age, and communications due to language barriers. Several principles may be considered when discussing potentially at-risk populations, including:

- Not all people who are considered at risk are at risk
- Outward appearance does not necessarily mark a person as at risk
- The hazard event will, in many cases, affect at risk population in differing ways

The following tables present information on select potential at risk populations within each participating Region E jurisdiction, by county. This information, from the U.S. Census Bureau QuickFacts, was research on a county level basis (information was available for jurisdictions with a population of greater than 5,000 persons only). The higher a jurisdiction's at-risk population the greater the potential vulnerability to identified hazards.

Table 3.9: Kansas Region E Potentially Vulnerable Population Data, Jurisdictions Over 5,000 Persons

Jurisdiction	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)	Percentage of Population Speaking Language Other Than English (2018)	Percentage of Population Living Below Poverty Level (2018)	Persons with a Disability, Under the Age of 65 (2018)
Barber County	6.1%	23.0%	4.5%	11.6%	10.1%
Barton County	6.3%	19.2%	11.8%	11.2%	10.5%
Comanche County	4.9%	25.6%	8.2%	11.2%	7.9%
Edwards County	6.0%	21.3%	20.6%	15.6%	9.0%
Kiowa County	6.7%	21.9%	9.1%	12.2%	10.4%

Table 3.9: Kansas Region E Potentially Vulnerable Population Data, Jurisdictions Over 5,000 Persons

Jurisdiction	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)	Percentage of Population Speaking Language Other Than English (2018)	Percentage of Population Living Below Poverty Level (2018)	Persons with a Disability, Under the Age of 65 (2018)
Pawnee County	6.4%	22.2%	12.2%	13.2%	10.8%
Pratt County	7.0%	20.2%	8.5%	11.2%	6.9%
Stafford County	4.1%	21.0%	5.2%	13.0%	11.2%

Source: US Census Bureau

Of note for Kanas Region E:

- Regionally, 5.9% of the total population is under the age of 5, below the State of Kansas average of 6.5%.
- Regionally, 21.8% of the total population is over the age of 65, above the State of Kansas average of 15.9%.
- Regionally, 10.0% of the total population speak a language other than English at home, above the State of Kansas average of 11.5%.
- Regionally, 12.4% of the total population live below the poverty line, above the State of Kansas average of 11.9%.
- Regionally, 9.6% of persons under the age of 65 have an identified disability, above the State of Kansas average of 8.8%.

3.4 – Regional Housing Data

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Over the period 2000 to 2017 the majority of Kansas Region E has been experiencing a yearly increase in housing stock. In general, the higher a jurisdiction's housing stock, the higher the hazard vulnerability.

Table 3.10: Barber County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Barber County	2,740	2,765	2,792	1.9%	2	5.9%
City of Hardtner	126	123	109	-13.5%	363	16.5%
City of Hazelton	67	58	77	14.9%	135	6.5%
City of Isabel	53	47	51	-3.8%	204	5.9%
City of Kiowa	569	578	529	-7.0%	499	6.0%
City of Medicine Lodge	1,085	1,031	1,188	9.5%	990	2.0%
City of Sharon	100	98	82	-18.0%	283	3.7%
City of Sun City	50	48	27	-46.0%	180	3.7%

Source: US Census Bureau

Of note for Barber County and its participating jurisdictions for the period 2000 to 2017:

- A housing gain was noted in Barber County, 1.9% as a whole

- Housing declines were noted in five of the seven participating cities

Table 3.11: Barton County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Barton County	12,888	12,696	12,698	-1.5%	14	6.1%
City of Albert	87	84	89	2.3%	371	12.4%
City of Claflin	316	299	312	-1.3%	945	0.6%
City of Ellinwood	1,034	1,042	1,080	4.4%	1,000	0.7%
City of Galatia	32	29	24	-25.0%	65	0.0%
City of Great Bend	7,080	7,113	7,336	3.6%	683	6.0%
City of Hoisington	1,449	1,361	1,180	-18.6%	1,000	0.3%
City of Olmitz	71	70	74	4.2%	435	8.1%
City of Pawnee Rock	158	137	159	0.6%	568	11.9%
City of Susank	27	25	12	-55.6%	133	0.0%

Source: US Census Bureau
-: No Data

Of note for Barton County and its participating jurisdictions for the period 2000 to 2017:

- A housing decline was noted in Barton County, 1.5% as a whole
- Housing declines were noted in four of the nine participating cities

Table 3.12: Comanche County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Comanche County	1,088	1,044	987	-9.3%	1	4.6%
City of Coldwater	460	458	451	-2.0%	171	4.2%
City of Protection	297	277	255	-14.1%	268	3.5%
City of Wilmore	41	34	16	-61.0%	80	0.0%

Source: US Census Bureau

Of note for Comanche County and its participating jurisdictions for the period 2000 to 2017:

- A housing decline was noted in Comanche County, -9.3% as a whole
- Housing declines were noted in all participating cities

Table 3.13: Edwards County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Edwards County	1,754	1,636	1,623	-7.5%	3	8.4%
City of Belpre	66	63	102	54.5%	249	3.9%
City of Kinsley	894	813	829	-7.3%	643	6.8%
City of Lewis	226	221	243	7.5%	736	14.4%
City of Offerle	90	92	102	13.3%	392	9.8%

Source: US Census Bureau

Of note for Edwards County and its participating jurisdictions for the period 2000 to 2017:

- A housing decline was noted in Edwards County, -7.5% as a whole
- Housing declines were noted in two of the four participating cities

Table 3.14: Kiowa County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Kiowa County	1,643	1,220	1,239	-24.6%	2	5.8%
City of Greensburg	887	431	486	-45.2%	326	0.4%
City of Haviland	250	261	279	11.6%	594	3.2%
City of Mullinville	132	132	119	-9.8%	198	13.4%

Source: US Census Bureau

Of note for Kiowa County and its participating jurisdictions for the period 2000 to 2017:

- A housing decline was noted in Kiowa County, -24.6% as a whole
- Housing gains were noted in two of the three participating cities

Table 3.15: Pawnee County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Pawnee County	3,114	3,152	3,167	1.7%	4	3.2%
City of Burdett	128	128	164	28.1%	656	0.0%
City of Garfield	97	102	125	28.9%	231	6.4%
City of Larned	2,079	2,130	2,091	0.6%	901	3.0%
City of Rozel	86	85	96	11.6%	436	3.1%

Source: US Census Bureau

Of note for Pawnee County and its participating jurisdictions for the period 2000 to 2017:

- A housing gain was noted in Pawnee County, 1.7% as a whole
- Housing gains were noted in all participating cities

Table 3.16: Pratt County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Pratt County	4,633	4,514	4,490	-3.1%	6	6.1%
City of Byers	20	21	13	-35.0%	72	15.4%
City of Coats	69	61	77	11.6%	385	16.9%
City of Cullison	54	44	30	-44.4%	167	10.0%
City of Iuka	87	83	103	18.4%	169	25.2%
City of Pratt	3,312	3,201	3,080	-7.0%	408	4.8%
City of Preston	97	82	97	0.0%	206	25.8%

Table 3.16: Pratt County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
City of Sawyer	76	70	83	9.2%	638	8.4%

Source: US Census Bureau

Of note for Pratt County and its participating jurisdictions for the period 2000 to 2017:

- A housing decline was noted in Pratt County, -3.1% as a whole
- Housing declines were noted in three of the seven participating cities

Table 3.17: Stafford County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2010	Housing Units 2017	Percent Housing Change 2000 - 2017	Housing Density, Per Square Mile, 2017	Percentage Mobile Homes 2017
Stafford County	2,458	2,319	2,338	-4.9%	3	5.1%
City of Hudson	68	66	74	8.8%	569	2.7%
City of Macksville	227	230	214	-5.7%	214	0.9%
City of Radium	19	19	14	-26.3%	350	0.0%
City of Seward	38	37	47	23.7%	188	8.5%
City of St. John	686	642	693	1.0%	385	1.3%
City of Stafford	640	622	668	4.4%	711	8.2%

Source: US Census Bureau

Of note for Stafford County and its participating jurisdictions for the period 2000 to 2017:

- A housing decline was noted in Stafford County, -4.9% as a whole
- Housing declines were noted in two of the six participating cities

3.5 – Regional Property Valuations

This section quantifies the built environment exposed to potential hazards in Kansas Region E. The following tables provide monetary value of structures, by category and where available, for each county in Kansas Region E. This information was derived from inventory data associated with FEMA's loss estimation software HAZUS-4.0. HAZUS classifies building stock types into multiple categories including residential, commercial, industrial, agriculture, government, and education. Values associated with each of these categories reflect 2010 valuations, the latest available HAZUS data.

In addition to the population information presented above, this information forms the basis of the vulnerability and risk assessment presented in this plan. This information was derived from inventory data associated with FEMA's loss estimation software HAZUS.

Table 3.18: Kansas Region E Property Valuations, Residential, Commercial and Industrial

County	Residential	Commercial	Industrial
Barber	$433,070,000	$105,656,000	$18,671,000
Barton	$2,398,960,000	$500,059,000	$258,077,000

Table 3.18: Kansas Region E Property Valuations, Residential, Commercial and Industrial

County	Residential	Commercial	Industrial
Comanche	$158,834,000	$27,821,000	$5,000,000
Edwards	$302,868,000	$54,652,000	$15,784,000
Kiowa	$224,580,000	$50,797,000	$6,998,000
Pawnee	$664,009,000	$77,874,000	$6,248,000
Pratt	$894,656,000	$177,358,000	$28,067,000
Stafford	$382,953,000	$71,150,000	$8,400,000

Table 3.19: Kansas Region E Property Valuations, Agriculture, Government and Education

County	Agriculture	Government	Education
Barber	$18,823,000	$7,038,000	$11,253,000
Barton	$42,686,000	$19,194,000	$43,950,000
Comanche	$9,086,000	$1,646,000	$14,019,000
Edwards	$10,714,000	$7,770,000	$9,613,000
Kiowa	$12,811,000	$3,243,000	$9,212,000
Pawnee	$12,049,000	$5,064,000	$9,940,000
Pratt	$21,716,000	$10,875,000	$56,107,000
Stafford	$20,701,000	$2,750,000	$14,795,000

Table 3.20: Kansas Region E Total Property Valuations

County	Total
Barber	$610,311,000
Barton	$3,331,357,000
Comanche	$222,342,000
Edwards	$408,386,000
Kiowa	$320,917,000
Pawnee	$794,977,000
Pratt	$1,209,374,000
Stafford	$515,938,000

3.6 – Critical Facility Data

A critical facility is essential in providing utility or direction either during the response to an emergency or during the recovery operation, with facilities determined from jurisdictional feedback. The following are examples of critical facilities and assets:

- Communications facilities
- Emergency operations centers
- Fire stations
- Government buildings
- Hospitals and other medical facilities
- Police stations

Details concerning critical facilities have been deemed as sensitive information, and as such their specific information is not contained in the body of this HMP, but is included in the restricted from public view Appendix D.

3.7 – Unified School Districts, Colleges and Universities

Each participating county is served by multiple Unified School Districts (USDs), with these USDs providing educational coverage for each participating jurisdiction. The following table presents participating USD enrollment information, the number of school structures, and the insured valuation of these structures and contents within (if information is available).

Table 3.21: Participating USD Information

School District	Estimated Enrollment (2018)	Number of Offices and Schools (2018)	Total Insured Valuation of Structures (2018)
Barber County			
USD #254 - Barber County North	483	-	-
USD #255 - South Barber County	241	-	-
Barton County			
USD #112 - Claflin	514	1	$30,000,000
USD #355 - Ellinwood	510	3	$33,400,000
USD #428 - Great Bend	2,900	11	$58,362,959
USD #431 - Hoisington	739	-	-
Comanche County			
USD #300- Comanche County	325	-	-
Edwards County			
USD #347 - Kinsley / Offerle	321	-	-
USD #502 - Lewis	128	-	-
Kiowa County			
USD #422 - Kiowa County	433	-	-
USD #474 - Haviland	107	-	-
Pawnee County			
USD #495 – Fort Larned	903	-	-
USD #496 – Pawnee Heights	149	-	-
Pratt County			
USD #382 - Pratt	1,346	10	-
USD #438 – Skyline Schools	393	-	-
Stafford County			
USD #349 - Stafford	246	-	-
USD #350 – St. John-Hudson	320	-	-
USD #351 - Macksville	237	-	-

Source: Kansas State Department of Education and Participating USD
-: Information unavailable

The following table presents participating college and university enrollment information, the number of school structures, and the insured valuation of these structures and contents within (if information is available).

Table 3.22: Participating College and University Information

School District	Estimated Enrollment (2018)	Number of Offices and Schools (2018)	Total Insured Valuation of Structures (2018)
Barton County			
Barton County Community College	4,000	50	$110,000,000
Kiowa County			
Barclay College	250	3	-
Pratt County			
Pratt Community College	1,110	17	-

Source: Participating College or University
-: Information unavailable

3.8 – Regional Land Use

In general, land use is determined by three major types of regulation, zoning ordinances, floodplain ordinances and building code requirements.

- 2017 Kansas Statutes, KS Stat § 12-741 (2017): This act is enabling legislation for the enactment of planning and zoning laws and regulations by cities and counties for the protection of the public health, safety and welfare, and is not intended to prevent the enactment or enforcement of additional laws and regulations on the same subject which are not in conflict with the provisions of this act.
- 2012 Kansas Statutes, Chapter 19 Counties and County Officers, Article 33 Flood Control: Allows cities and counties to develop stormwater management and flood control projects and programs, provide local funding, and enter into agreements with other agencies to develop and use flood control works.
- The Kansas State Legislature has not implemented a statewide building code, nor does it require comprehensive planning by local governments.

These three types of regulations can assist in preventing the following:

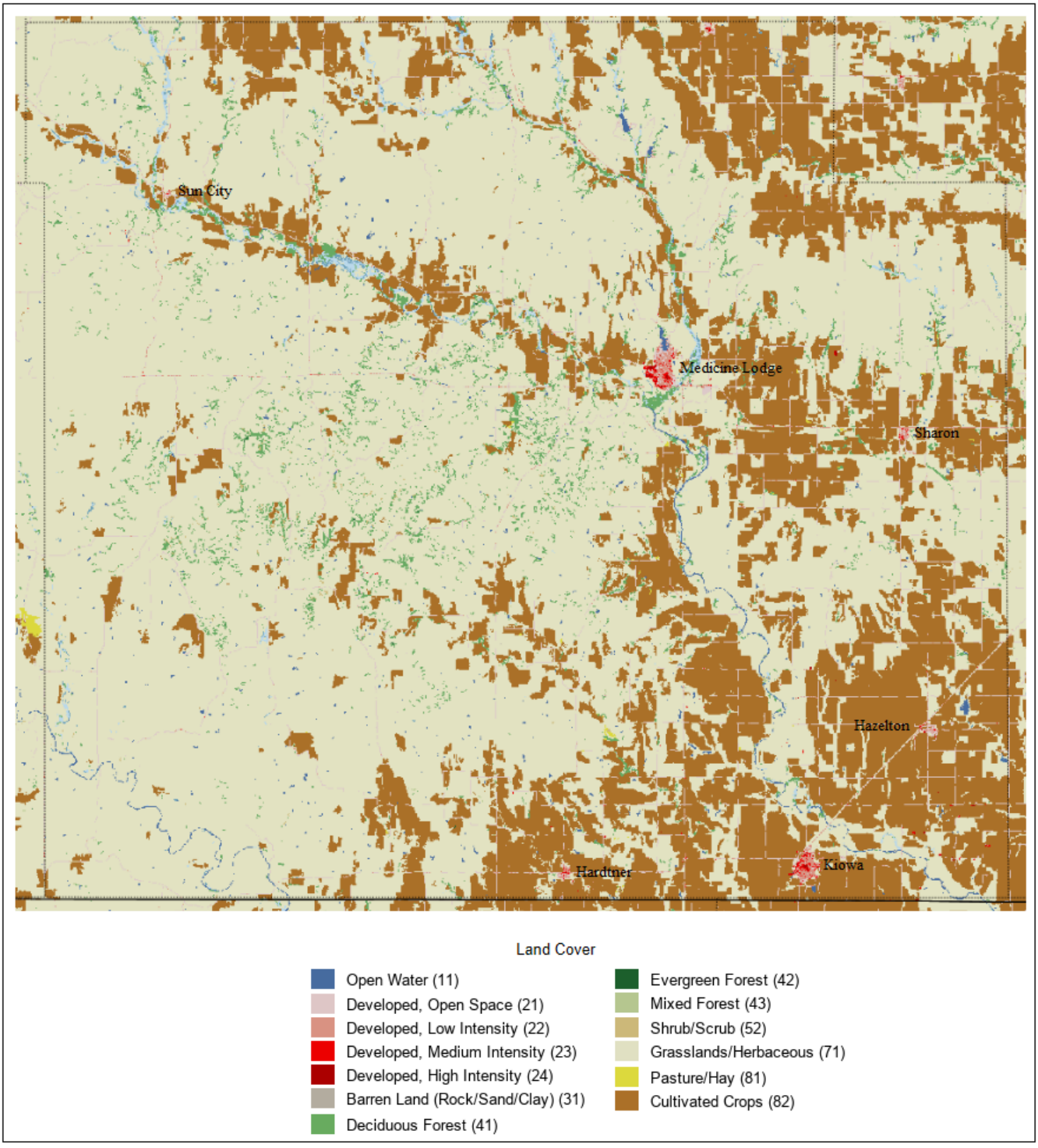
- Unrestricted residential growth which can increase a population's exposure to identified hazard prone areas
- Rapid, unchecked development that can put a strain on a community's vulnerable resources such as its energy infrastructure
- Residential development constructed quickly and inexpensively to meet consumer demand that often lacks long term mitigation measures and resiliency
- Rapid development under pressure to meet consumer demand can alter the landscape in ways affecting urban runoff, drainage, or other environmental considerations which have drastic effects on floodplains

Information on relevant codes and ordinances may be found in Section 5 of this HMP.

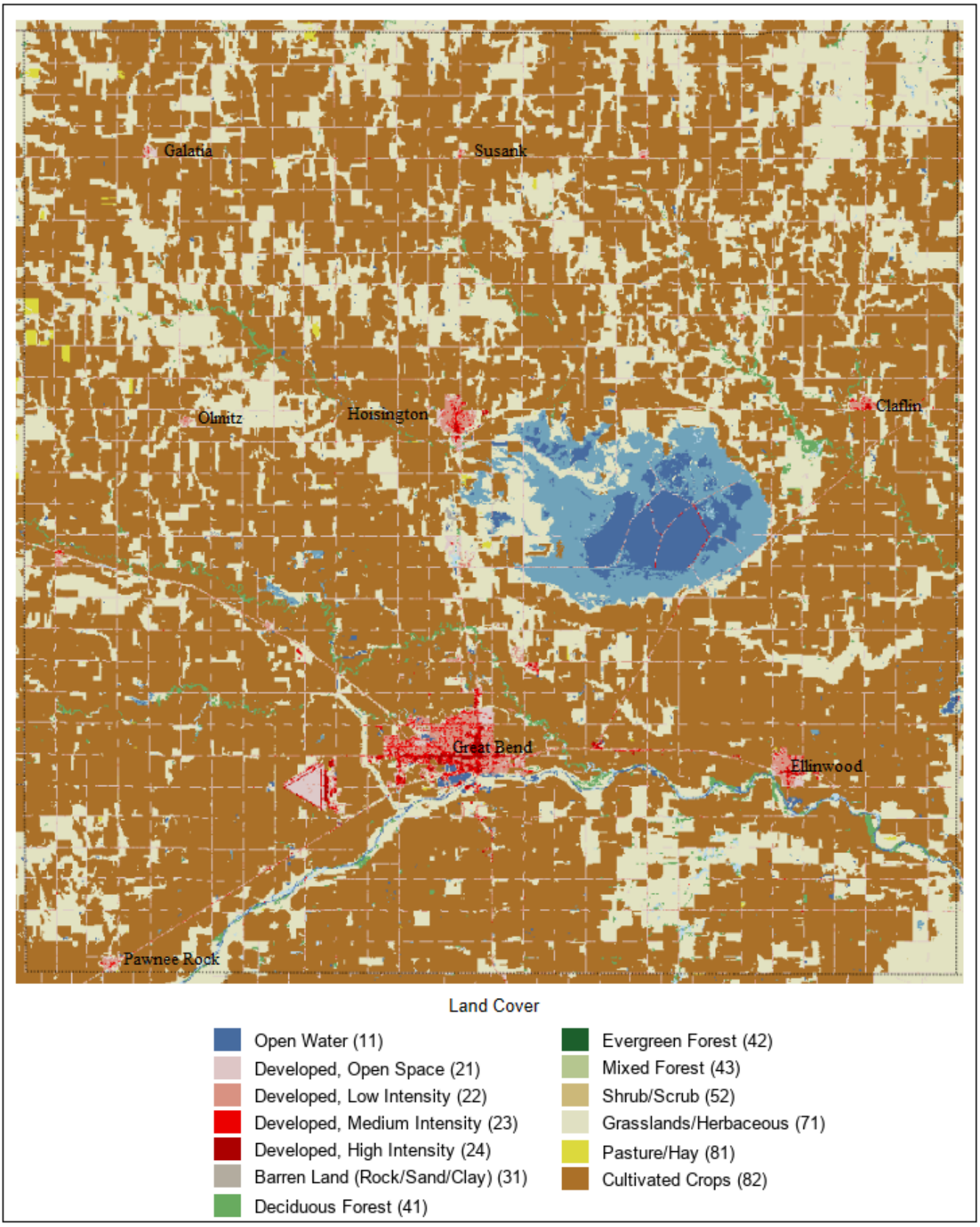
3.9 – Regional Land Cover

The 2016 USGS land cover map illustrates land usage. As indicated by the following maps, large areas of the region are grasslands and cultivated crops. Additionally, each county has at least one area of low to high intensity development corresponding with larger cities.

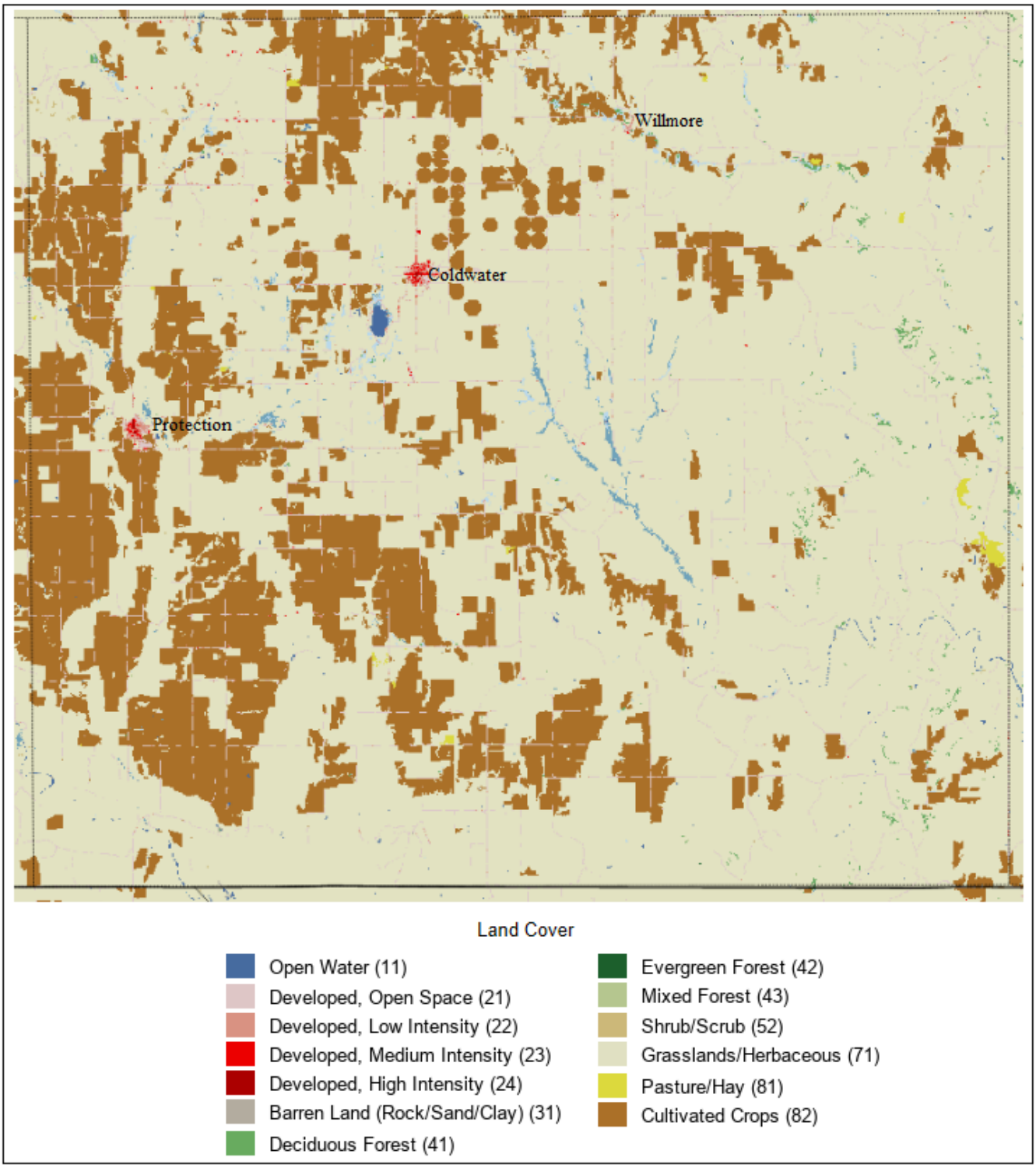
Barber County Land Cover Map



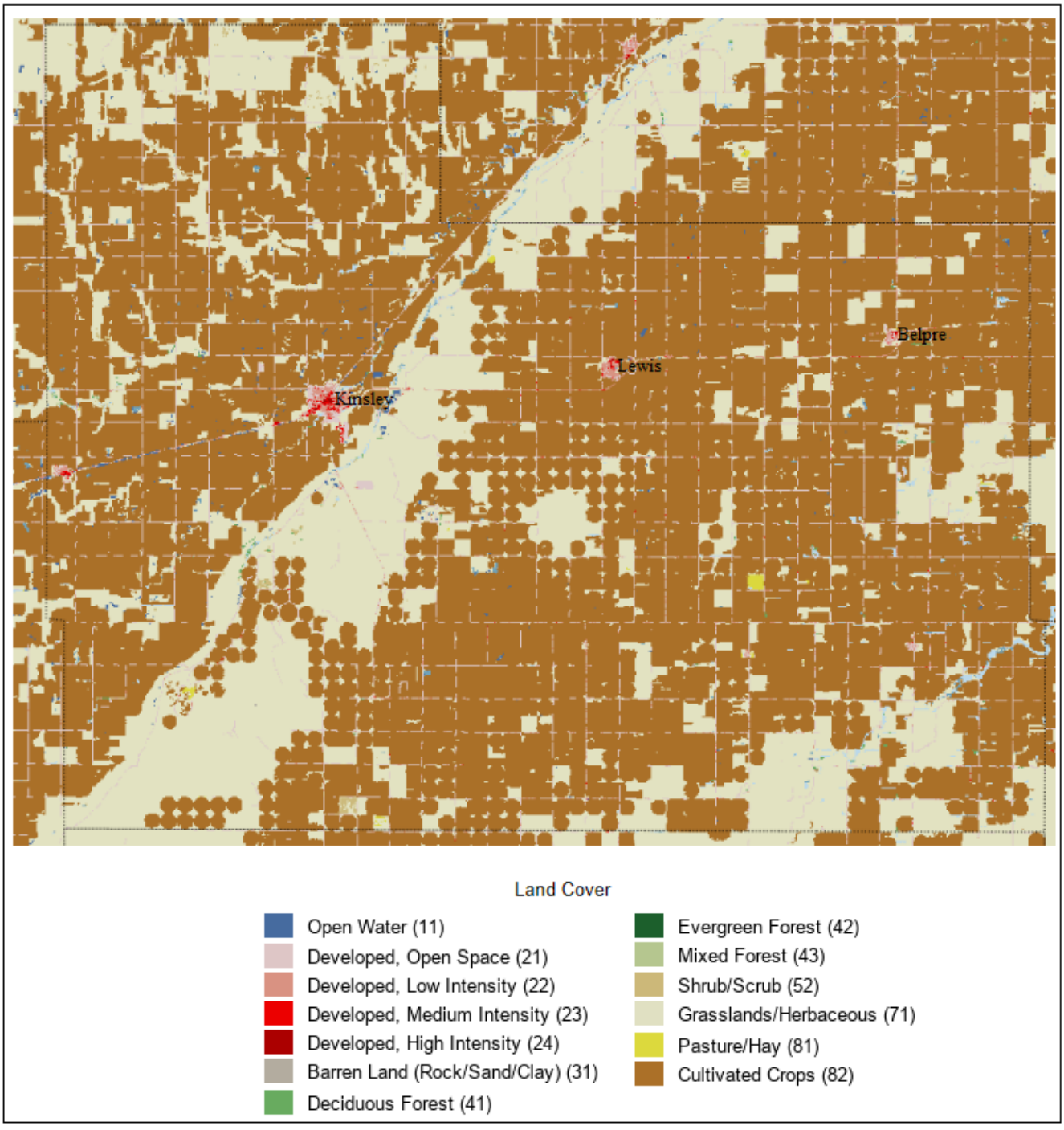
Barton County Land Cover Map



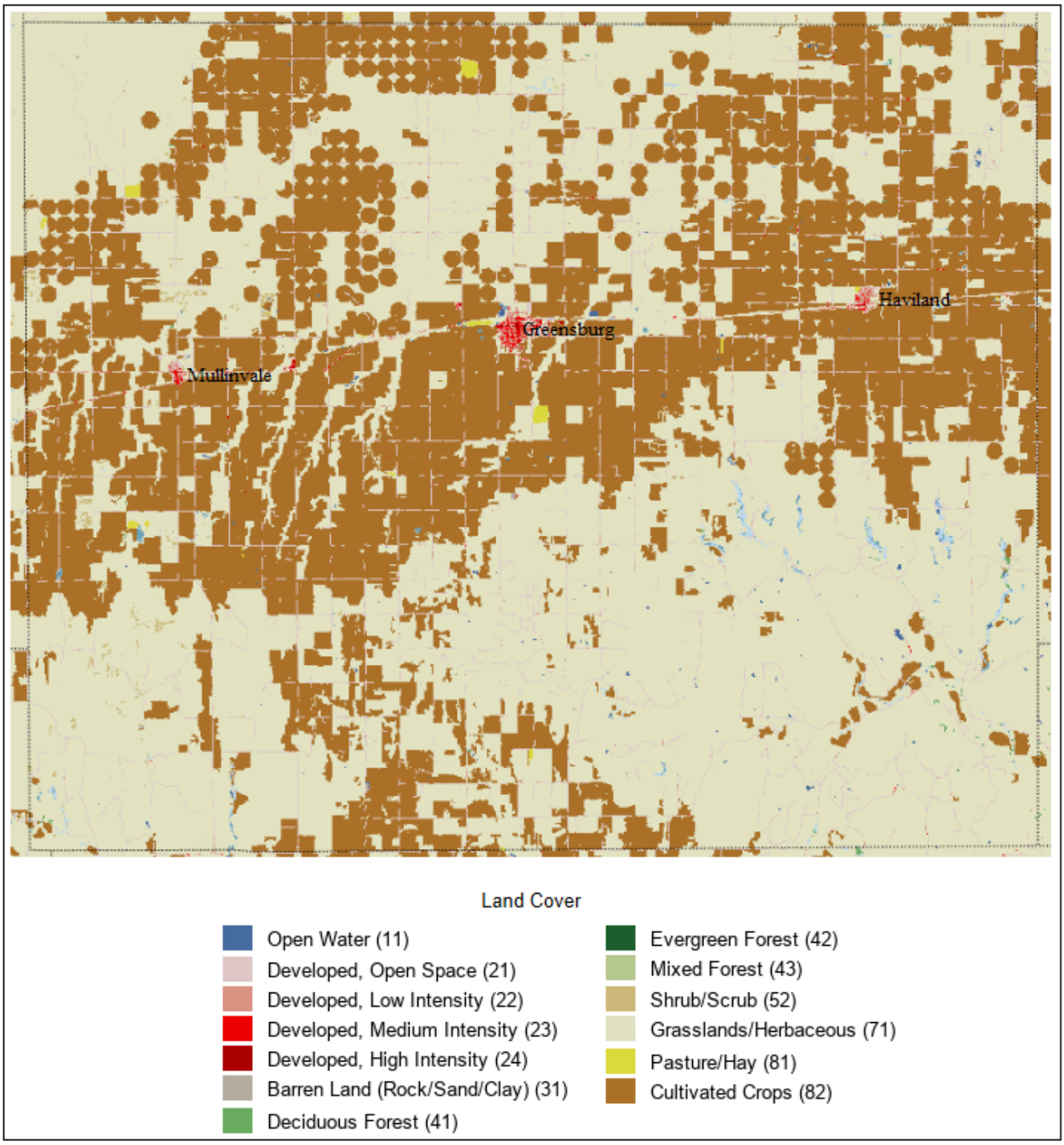
Comanche County Land Cover Map



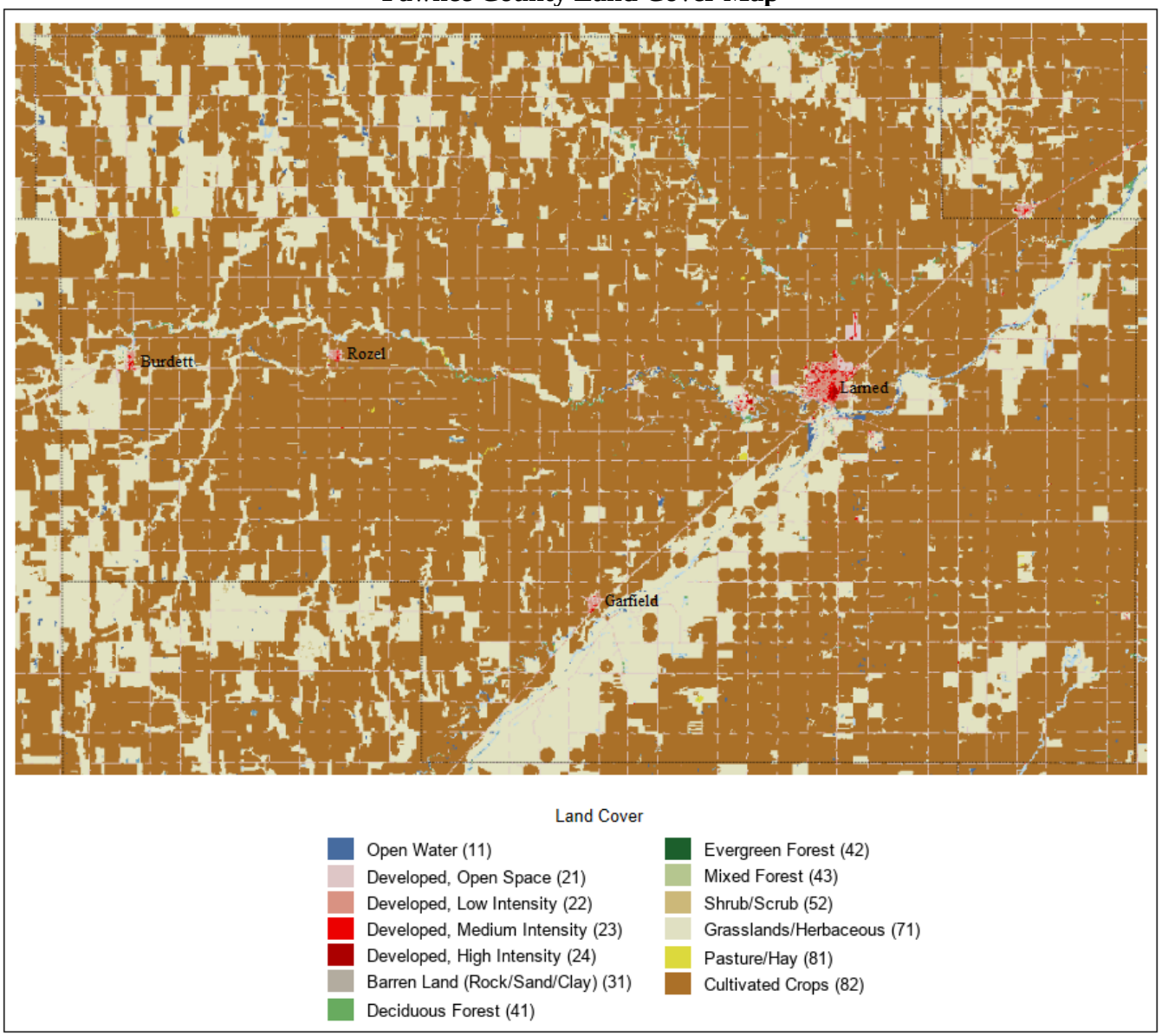
Edwards County Land Cover Map



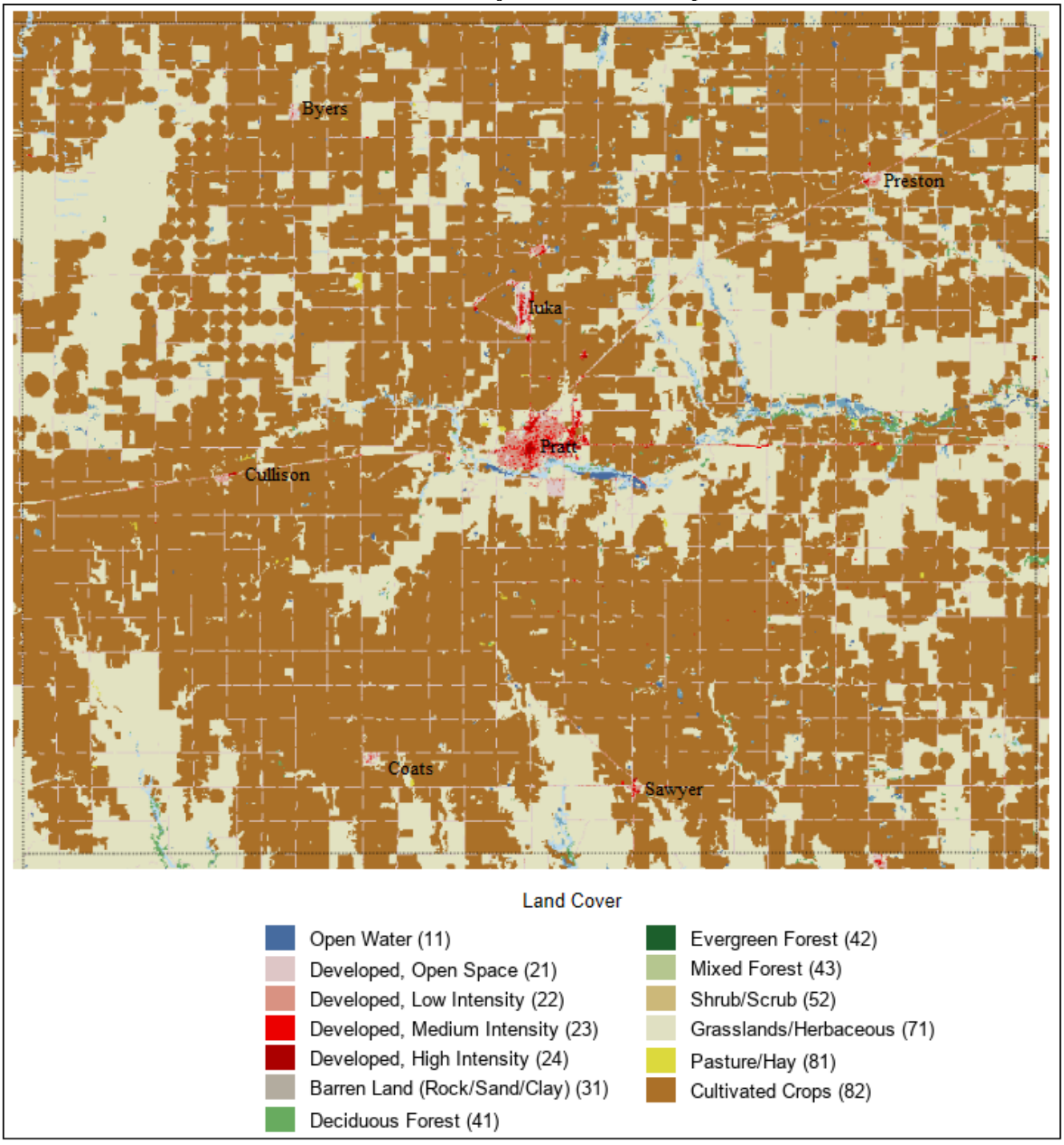
Kiowa County Land Cover Map



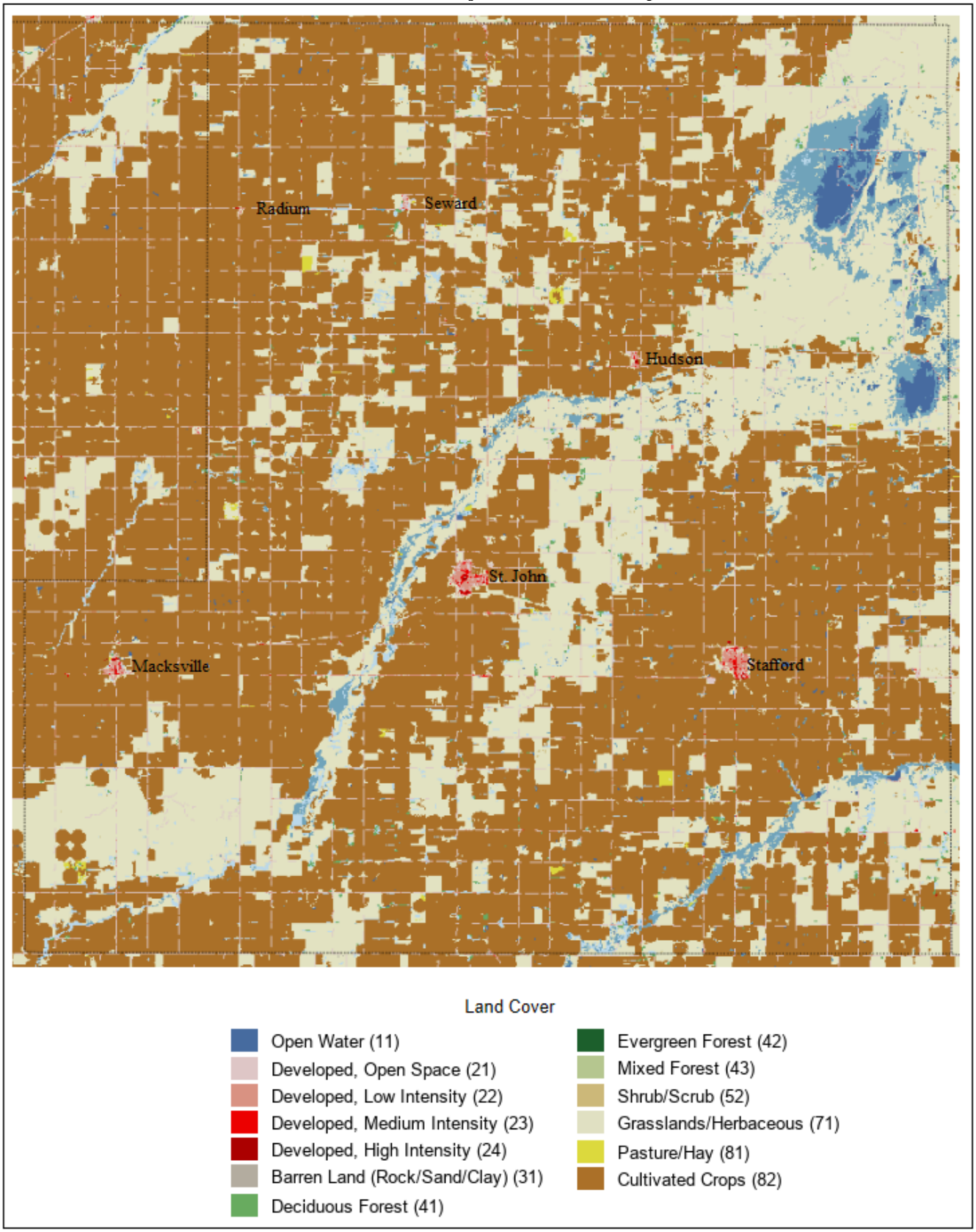
Pawnee County Land Cover Map



Pratt County Land Cover Map



Stafford County Land Cover Map



3.10 – Regional Agricultural Data

Agriculture is a major component of the economy of Kansas. According to the Kansas Department of Agriculture, Agriculture is the largest economic driver in Kansas, valued at nearly $67.5 billion and accounting for 44.5 percent of the state's total economy. In Kansas, there are 46,137,295 acres of farmland, which accounts for 88 percent of all Kansas land.

The following tables present information from the USDA National Agricultural Statistics Service 2017 Census of Agriculture (the latest available data) relating to farm totals and agricultural acreage, livestock (cattle, hogs and pigs), and agricultural market value for Kansas Region E.

Table 3.23: Kansas Region E Farm Data, 2017 Census of Agriculture

Jurisdiction	Number of Farms	Farm Acreage	Cropland Acreage	Pasture and Other Usage Acreage
Barber	362	631,631	236,520	
Barton	628	557,961	452,271	
Comanche	197	453,556	152,257	
Edwards	249	392,025	275,129	
Kiowa	359	442,981	256,307	
Pawnee	362	474,275	397,884	
Pratt	481	465,191	366,455	
Stafford	466	493,694	392,975	

Source: United States Department of Agriculture National Agricultural Statistics Service

Table 3.24: Kansas Region E Farm Data, 2017 Census of Agriculture

Jurisdiction	Cattle	Hogs	Sheep	Chicken Layers
Barber	63,466	258	D	-
Barton	107,438	9,446	52	-
Comanche	45,571	D	-	-
Edwards	67,286	20	-	-
Kiowa	26,582	D	211	-
Pawnee	74,300	-	311	D
Pratt	63,736	7	D	-
Stafford	52,850	14	1,054	-

Source: United States Department of Agriculture National Agricultural Statistics Service
(D): Data not reported due to privacy concerns

Table 3.25: Kansas Region E Farm Data, 2017 Census of Agriculture

Jurisdiction	Total Agricultural Commodity Sales	Crop Sales	Animal Sales
Barber	$93,568,000	$38,214,000	$55,353,000
Barton	$365,672,000	$75,111,000	$290,561,000
Comanche	$51,803,000	$16,377,000	$35,426,000
Edwards	$228,780,000	$68,831,000	$158,949,000
Kiowa	$72,281,000	$56,633,000	$18,648,000
Pawnee	$307,888,000	$77,313,000	$230,575,000
Pratt	$271,307,000	$91,232,000	$180,074,000
Stafford	$198,573,000	$82,480,000	$116,092,000

Source: United States Department of Agriculture National Agricultural Statistics Service

3.11 – Regional Development Trends

44 CFR 201.6 (c)(2)(ii)(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas

Future development speaks to the potential impacts of land use and demographic changes in hazard prone areas. Data in this section is based on the best available data but is speculative as future conditions are subject to numerous unpredictable factors. While past trends are used to inform the discussion, previous historical trends are no guarantee of future conditions.

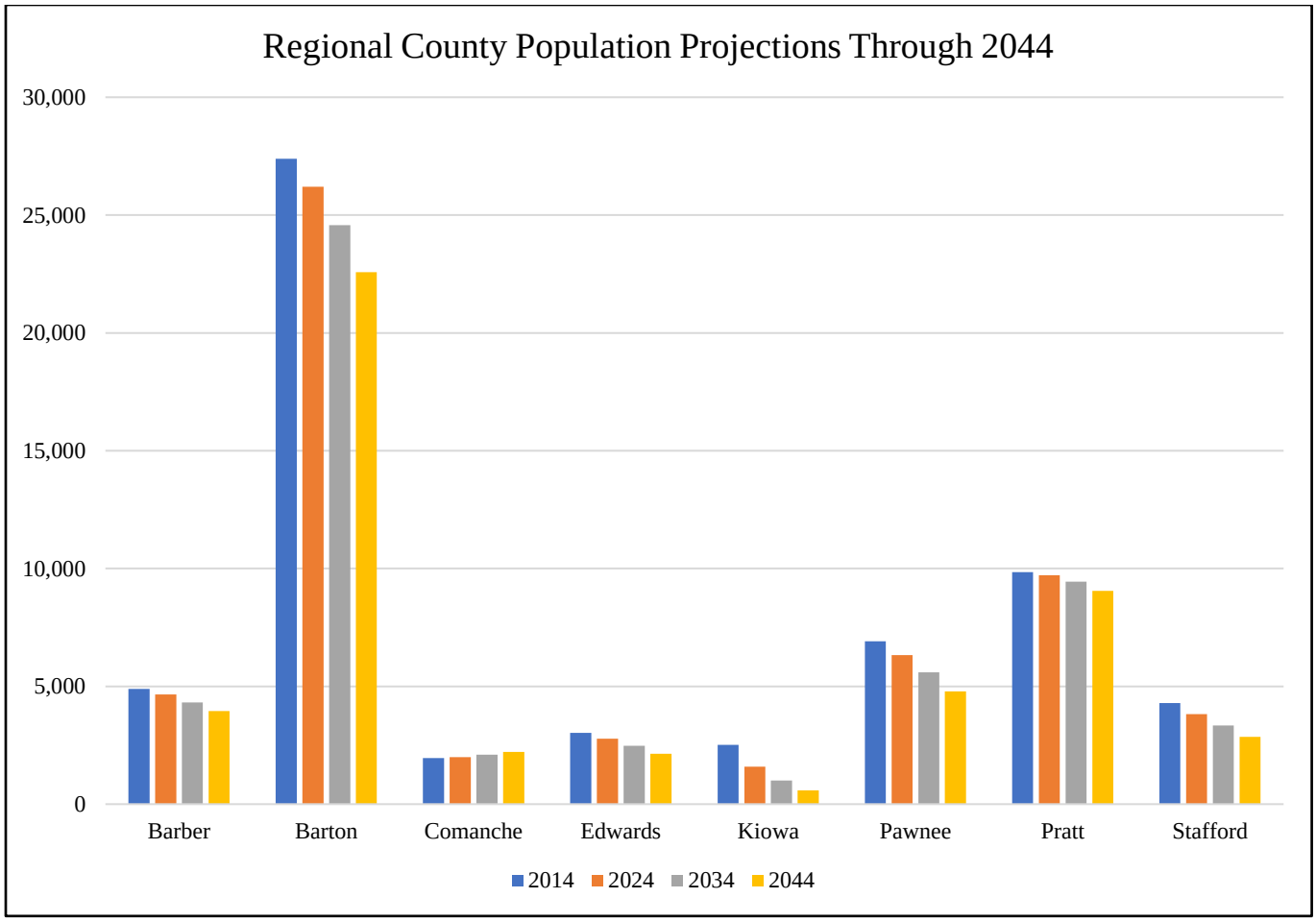
The University of Kansas Institute for Policy and Social Research developed population projections for the region using historical and trend data. Indications are the region will experience a steady decrease in the population through the year 2044.

Table 3.26: Kansas Region E Population Projections Through 2044

County	2014	2024	2034	2044	Projected Growth Percentage Through 2044
Barber	4,897	4,651	4,316	3,954	-19.3%
Barton	27,385	26,205	24,566	22,574	-17.6%
Comanche	1,954	1,991	2,097	2,224	13.8%
Edwards	3,030	2,781	2,475	2,135	-29.5%
Kiowa	2,513	1,594	1,004	584	-76.8%
Pawnee	6,916	6,321	5,591	4,786	-30.8%
Pratt	9,850	9,712	9,440	9,046	-8.2%
Stafford	4,297	3,821	3,339	2,853	-34.0%

Source: University of Kansas Institute for Policy and Social Research

The following chart illustrates the above data.



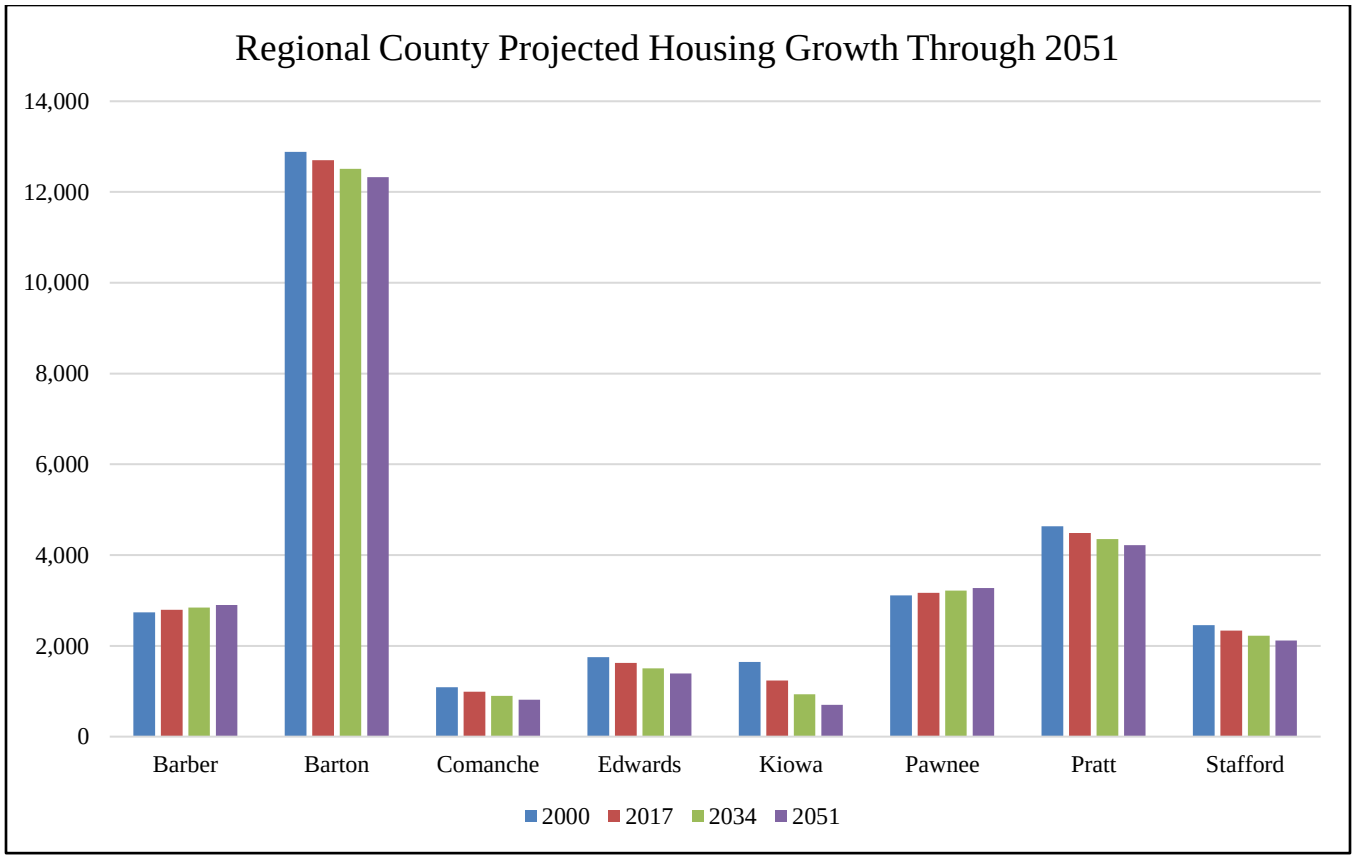
US Census Bureau data was used to develop housing projections for the region using historical and trend data. Indications are the region will experience steady to static growth in housing through the year 2051.

Table 3.27: Kansas Region E Housing Projections Through 2051

County	2000	2017	2034	2051	Projected Growth Percentage Through 2051
Barber	2,740	2,792	2,845	2,899	1.9%
Barton	12,888	12,698	12,511	12,326	-1.5%
Comanche	1,088	987	895	812	-9.3%
Edwards	1,754	1,623	1,502	1,390	-7.5%
Kiowa	1,643	1,239	934	705	-24.6%
Pawnee	3,114	3,167	3,221	3,276	1.7%
Pratt	4,633	4,490	4,351	4,217	-3.1%
Stafford	2,458	2,338	2,224	2,115	-4.9%

Source: US Census Bureau

The following chart illustrates the above data.



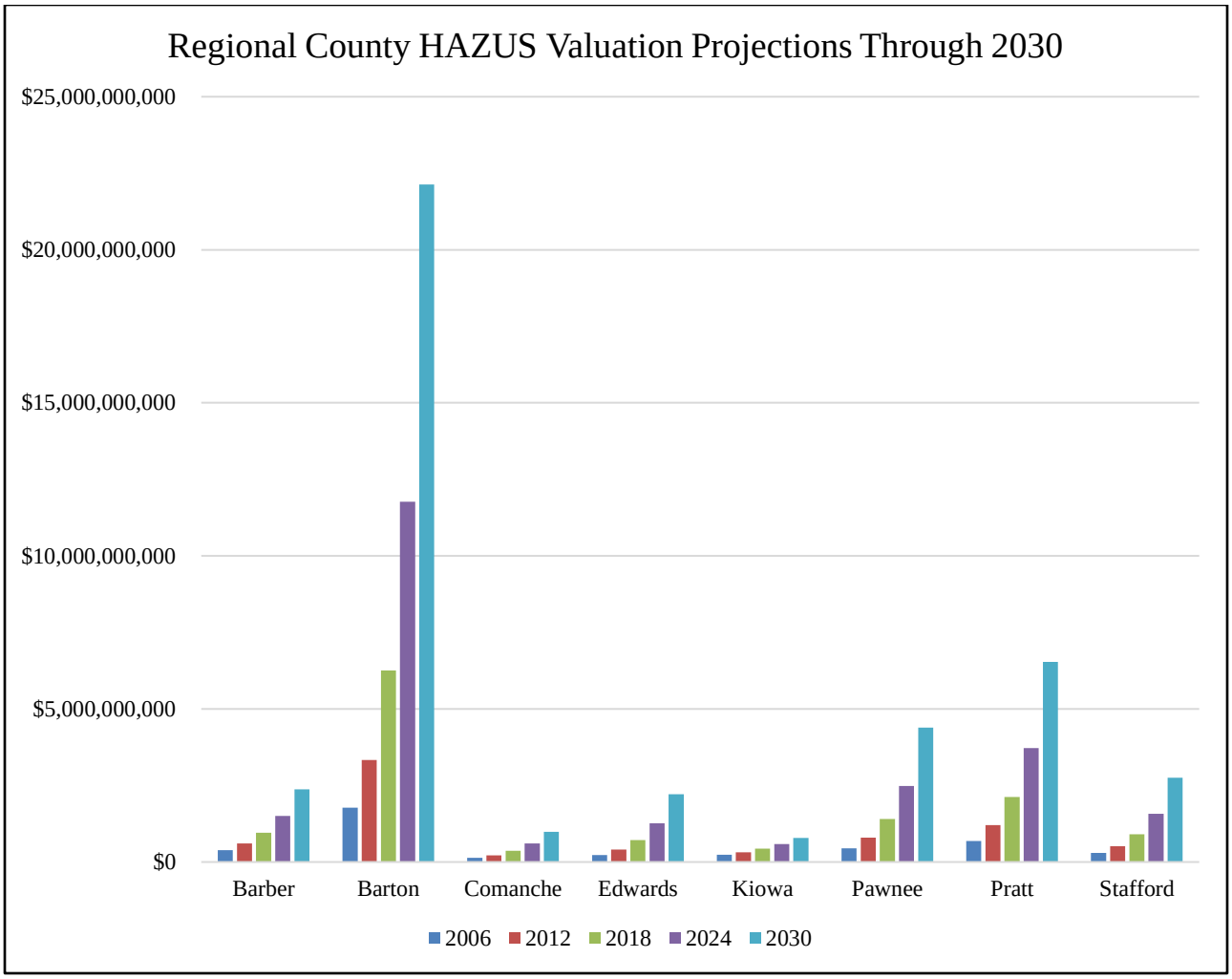
FEMA's loss estimation software HAZUS data was used to developed property valuation projections for the region using historical and trend data. Indications are the region will experience steady growth in the property valuation through the year 2030.

Table 3.28: Kansas Region E Property Valuation Projections Through 2030

County	2006	2012	2018	2024	2030	Projected Growth Percentage Through 2030
Barber	$388,136,000	$610,311,000	$959,662,378	$1,508,987,843	$2,372,755,631	57.2%
Barton	$1,772,118,000	$3,331,357,000	$6,262,528,489	$11,772,758,993	$22,131,293,221	88.0%
Comanche	$135,138,000	$222,342,000	$365,818,385	$601,879,497	$990,269,880	64.5%
Edwards	$232,382,000	$408,386,000	$717,693,819	$1,261,268,549	$2,216,541,804	75.7%
Kiowa	$237,655,000	$320,917,000	$433,349,691	$585,172,973	$790,187,267	35.0%
Pawnee	$449,592,000	$794,977,000	$1,405,693,230	$2,485,573,112	$4,395,036,958	76.8%
Pratt	$689,239,000	$1,209,374,000	$2,122,029,473	$3,723,421,443	$6,533,305,695	75.5%
Stafford	$295,331,000	$515,938,000	$901,334,502	$1,574,615,331	$2,750,824,955	74.7%

Source: HAZUS

The following chart illustrates the above data.



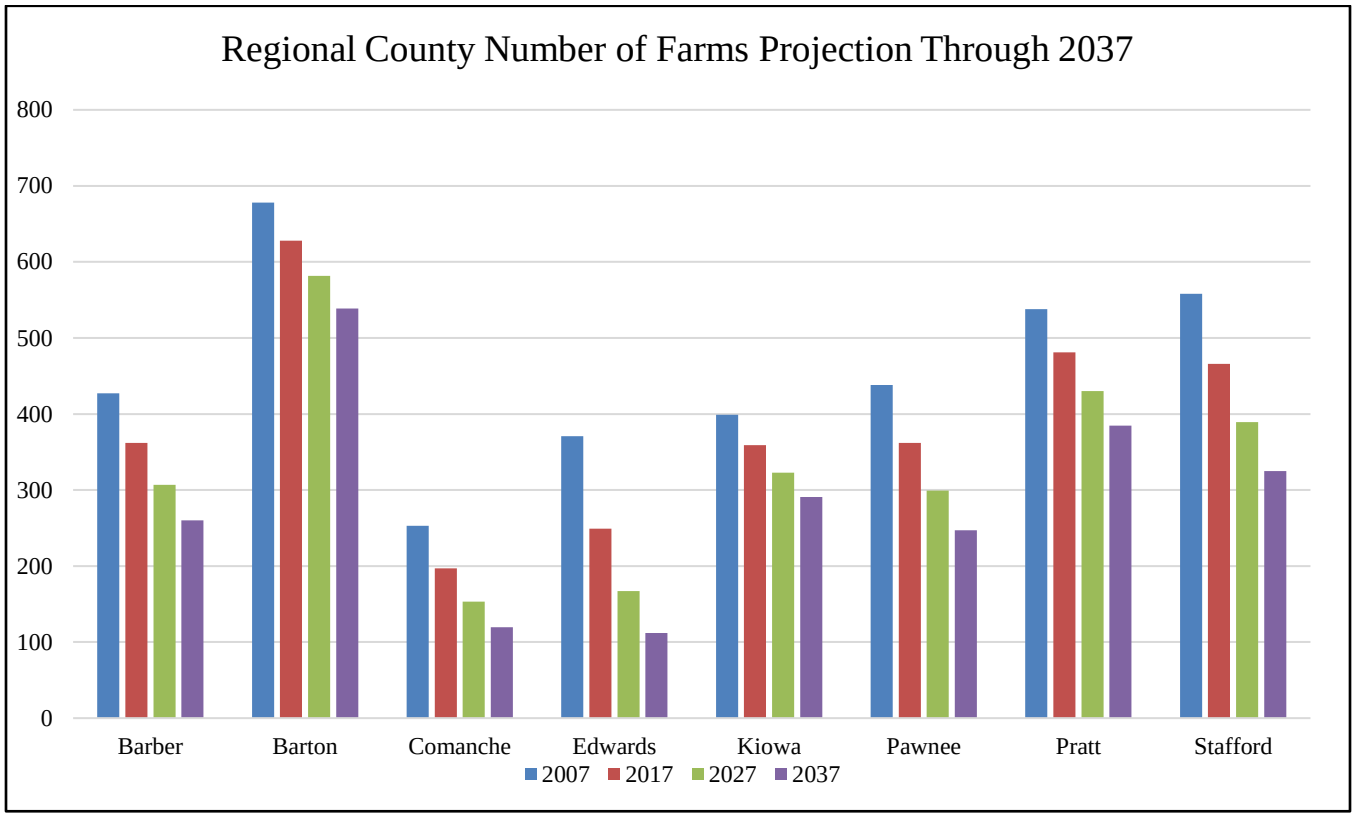
The United States Department of Agriculture (USDA) National Agricultural Statistics Service data was used to develop agricultural projections for the region using historical and trend data. Indications are the region will experience a steady increase in the number of farms through the year 2037.

Table 3.29: Kansas Region E Number of Farms Data Projections Through 2037

County	Number of Farms, 2007	Number of Farms, 2017	Number of Farms, 2027	Number of Farms, 2037	Projected Growth Percentage Through 2037
Barber	427	362	307	260	-15.2%
Barton	678	628	582	539	-7.4%
Comanche	253	197	153	119	-22.1%
Edwards	371	249	167	112	-32.9%
Kiowa	399	359	323	291	-10.0%
Pawnee	438	362	299	247	-17.4%
Pratt	538	481	430	384	-10.6%
Stafford	558	466	389	325	-16.5%

Source: United States Department of Agriculture National Agricultural Statistics Service

The following chart illustrates the above data.



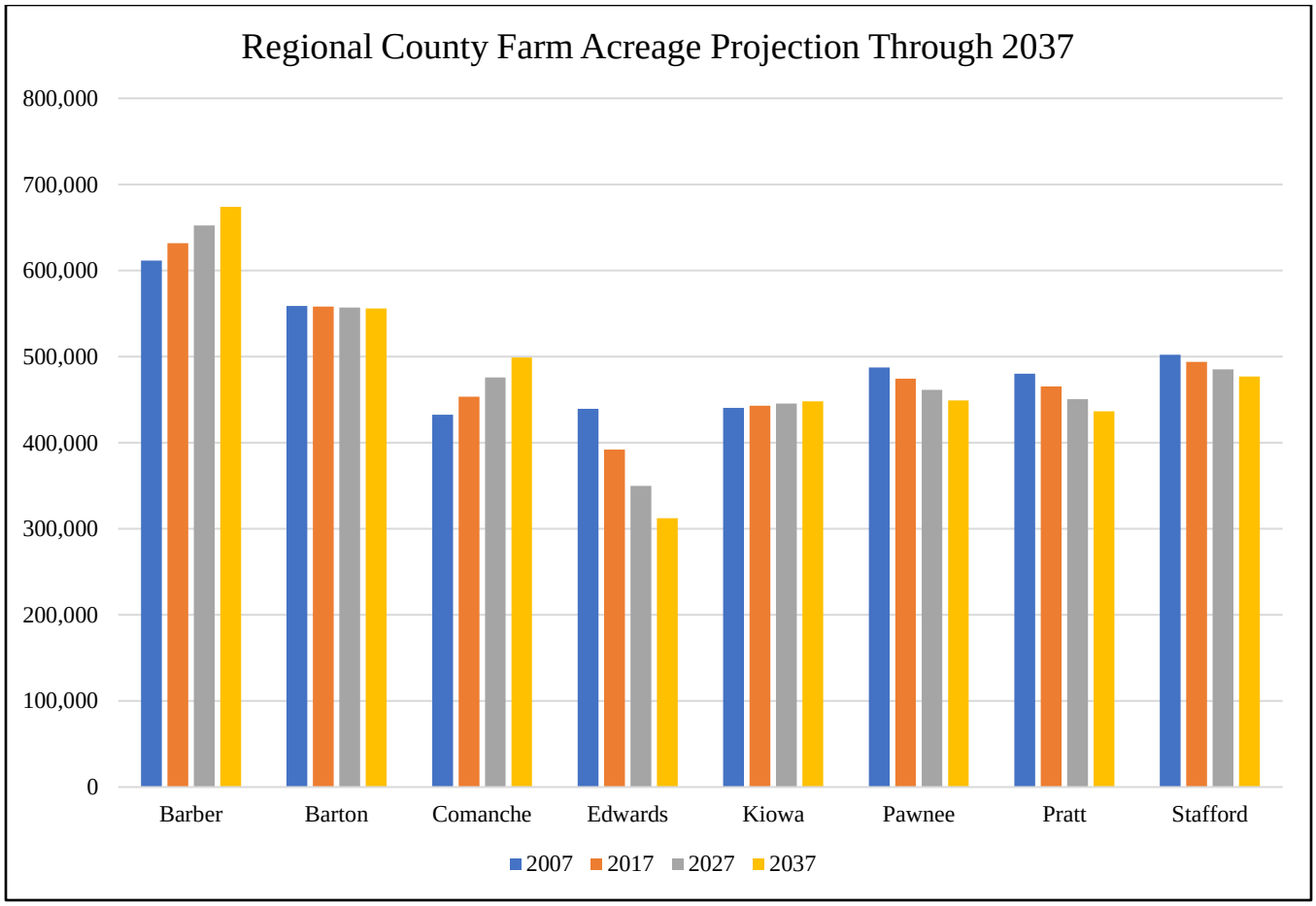
USDA National Agricultural Statistics Service data indicates the region will experience steady increase in farm acreage through the year 2037.

Table 3.30: Kansas Region E Farm Acreage Data Projections Through 2037

County	Farm Acreage, 2007	Farm Acreage, 2017	Farm Acreage, 2027	Farm Acreage, 2037	Projected Growth Percentage Through 2037
Barber	611,493	631,631	652,432	673,918	3.3%
Barton	558,977	557,961	556,947	555,935	-0.2%
Comanche	432,378	453,556	475,771	499,075	4.9%
Edwards	439,243	392,025	349,883	312,271	-10.7%
Kiowa	440,473	442,981	445,503	448,040	0.6%
Pawnee	487,373	474,275	461,529	449,126	-2.7%
Pratt	480,162	465,191	450,687	436,635	-3.1%
Stafford	502,229	493,694	485,304	477,057	-1.7%

Source: United States Department of Agriculture National Agricultural Statistics Service

The following chart illustrates the above data.



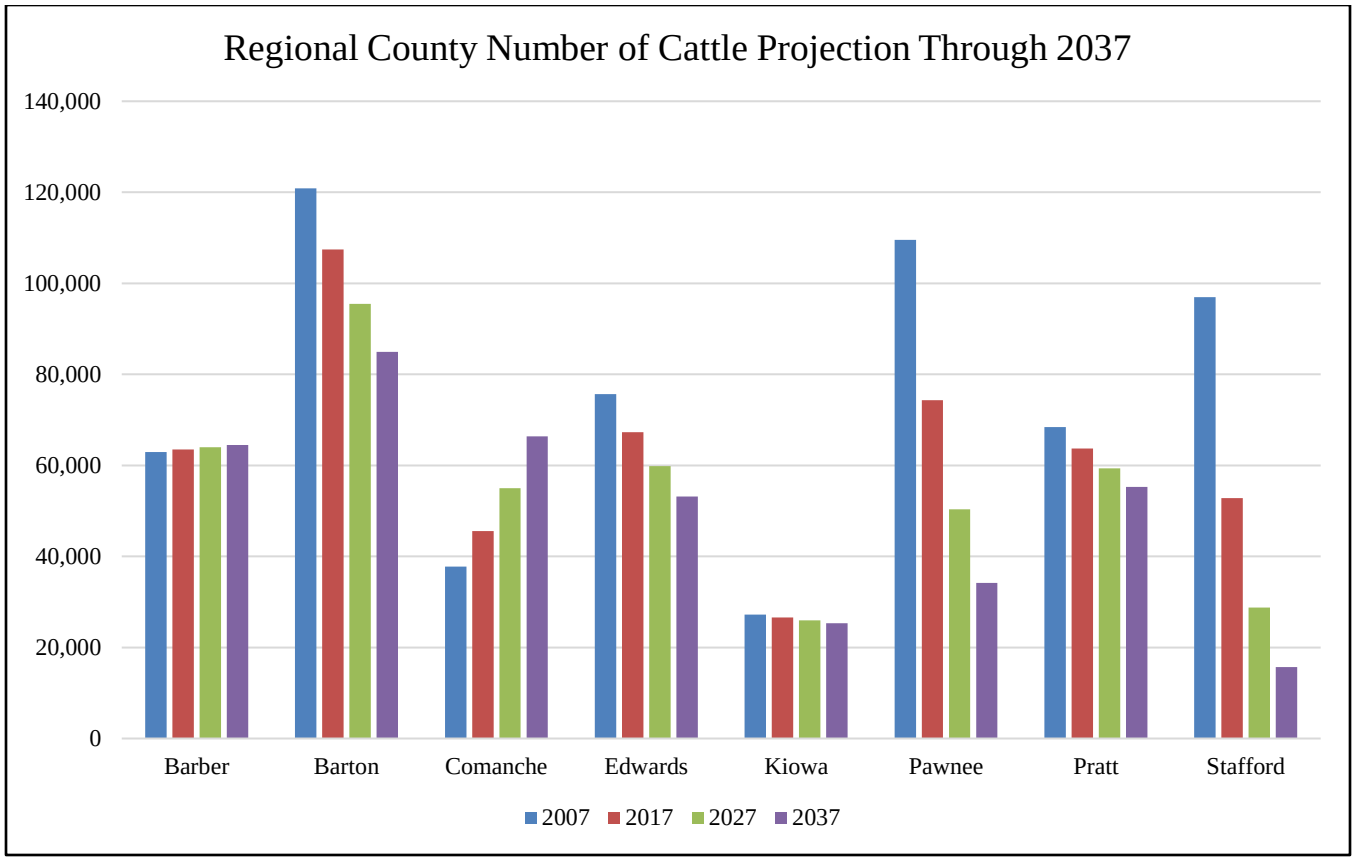
USDA National Agricultural Statistics Service data indicates the region will experience steady increase in the number of cattle through the year 2037.

Table 3.31: Kansas Region E Total Cattle Data Projections Through 2037

County	Cattle, 2007	Cattle, 2017	Cattle, 2027	Cattle, 2037	Projected Growth Percentage Through 2037
Barber	62,949	63,466	63,987	64,513	62,949
Barton	120,851	107,438	95,514	84,913	120,851
Comanche	37,748	45,571	55,015	66,417	37,748
Edwards	75,672	67,286	59,829	53,199	75,672
Kiowa	27,249	26,582	25,931	25,297	27,249
Pawnee	109,574	74,300	50,381	34,163	109,574
Pratt	68,429	63,736	59,365	55,293	68,429
Stafford	96,994	52,850	28,797	15,691	96,994

Source: United States Department of Agriculture National Agricultural Statistics Service

The following chart illustrates the above data.



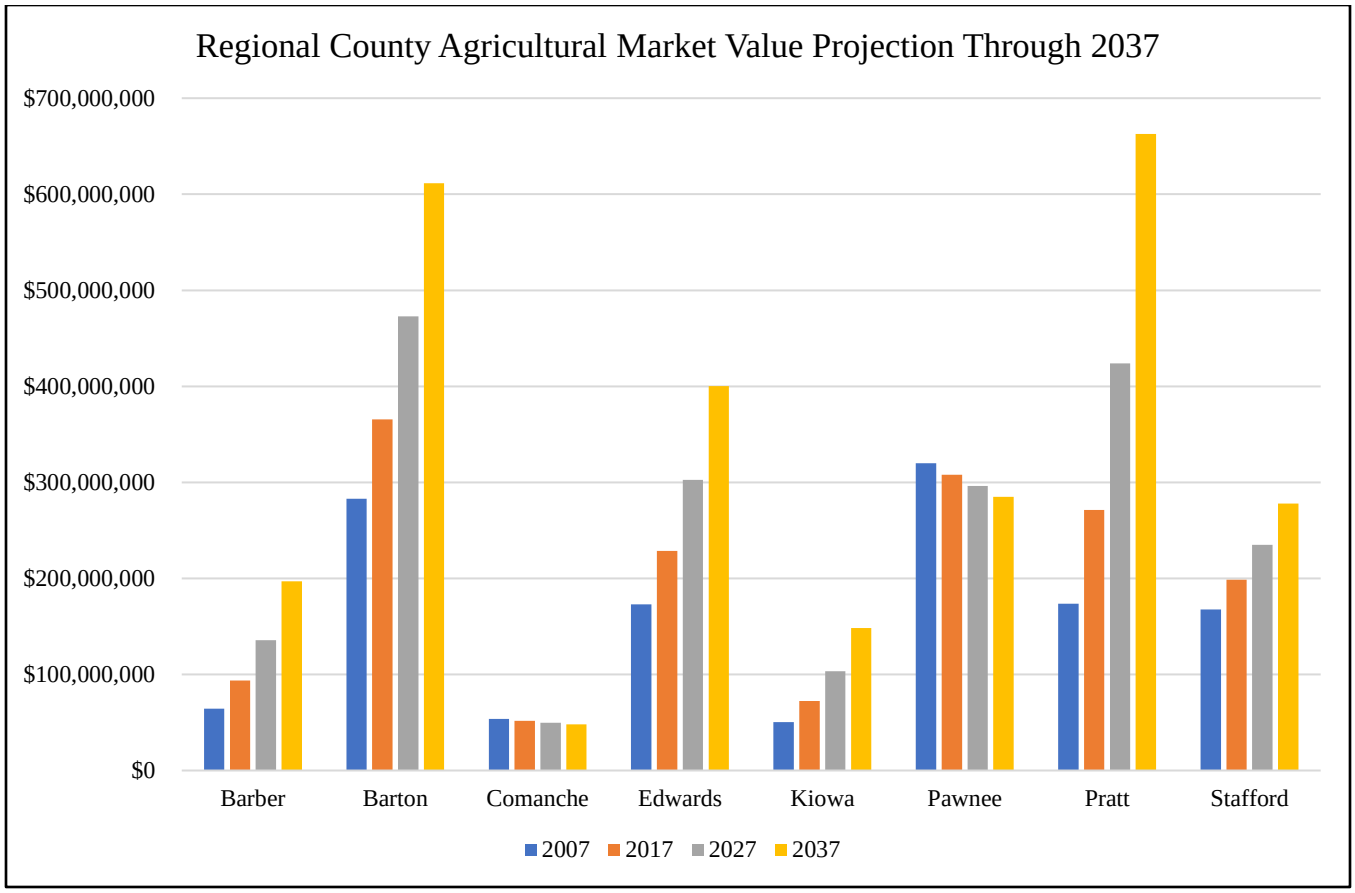
USDA National Agricultural Statistics Service data indicates the region will experience a continued increase in the market value of agricultural products through the year 2037.

Table 3.32: Kansas Region E Agricultural Market Value Data Projections Through 2037

County	Market Value, 2007	Market Value, 2017	Market Value, 2027	Market Value, 2037	Projected Growth Percentage Through 2037
Barber	$64,475,000	$93,568,000	$135,788,610	$197,060,390	45.1%
Barton	$282,786,000	$365,672,000	$472,852,304	$611,447,694	29.3%
Comanche	$53,837,000	$51,803,000	$49,845,846	$47,962,635	-3.8%
Edwards	$172,990,000	$228,780,000	$302,562,509	$400,140,186	32.3%
Kiowa	$50,462,000	$72,281,000	$103,534,203	$148,300,815	43.2%
Pawnee	$320,071,000	$307,888,000	$296,168,727	$284,895,529	-3.8%
Pratt	$173,605,000	$271,307,000	$423,994,057	$662,610,844	56.3%
Stafford	$167,828,000	$198,573,000	$234,950,284	$277,991,651	18.3%

Source: United States Department of Agriculture National Agricultural Statistics Service

The following chart illustrates the above data.



Future development speaks to the potential impacts of land use and demographic changes in hazard prone areas. Future development data is speculative as future conditions are subject to numerous unpredictable factors. While past trends are used to inform the discussion, these historical trends are no guarantee of future conditions.

For hazards that affect the entire planning area, the predicted regional decrease in population will tend to decrease potential vulnerability. It is difficult to quantify the exact change in vulnerability, but it can be depicted as generally directly proportional to the population change itself.

For hazards that affect the entire planning area, the predicted regional overall decrease in structures will tend to decrease potential vulnerability. It is difficult to quantify the exact change in vulnerability, but it can be depicted as generally directly proportional to the change in the number of structures.

As indicated in the data above, while there is predicted regional farm acreage decrease, the market value of regional agricultural goods will continue to increase. These continuing agricultural gains could result in increased exposure to both natural and man-made hazards.

3.12 – Regional Economic Activity Patterns

Kansas Region E's continued economic growth can impact future vulnerability in two ways, by location-based growth in identified hazard prone areas or by the industry type itself, as is the case with chemical manufacturing.

Gross domestic product (GDP) is a measure of the entire output of a defined economy, and roughly equals the total dollar amount of all goods and services produced within a defined area. GDP is the most comprehensive measure of economic activity and business growth. The following table, using data from the Bureau of Economic Analysis, details GDP for all Kansas Region E counties for the period 2012 to 2015 (the latest available data).

Table 3.33: Kansas Region E Gross Domestic Product, 2012 to 2015

County	2012	2013	2014	2015	State Rank in 2015 (out of 105)
Barber	$190,275	$210,829	$195,906	$184,514	68
Barton	$1,214,307	$1,201,331	$1,263,241	$1,207,594	19
Comanche	$52,009	$58,151	$58,989	$54,040	105
Edwards	$129,835	$140,175	$136,089	$146,759	75
Kiowa	$108,263	$133,856	$122,237	$134,729	80
Pawnee	$300,065	$323,346	$281,879	$262,958	55
Pratt	$436,411	$475,495	$466,244	$439,999	36
Stafford	$169,952	$177,769	$167,186	$162,466	74

Source: Bureau of Economic Analysis

The following table, using data from the Bureau of Economic Analysis, details the percentage GDP change from the preceding period for 2012 to 2015 (the latest available data).

Table 3.34: Kansas Region E GDP Percentage Change from Preceding Period, 2012 to 2015

County	2013	2014	2015	State Rank in 2015 (out of 105)
Barber	10.8%	-7.1%	-5.8%	90
Barton	-1.1%	5.2%	-4.4%	81
Comanche	11.8%	1.4%	-8.4%	101
Edwards	8.0%	-2.9%	7.8%	4
Kiowa	23.6%	-8.7%	10.2%	2
Pawnee	7.8%	-12.8%	-6.7%	97
Pratt	9.0%	-1.9%	-5.6%	88
Stafford	4.6%	-6.0%	-2.8%	69

Source: Bureau of Economic Analysis

The average Kansas Region E unemployment rate for August 2019 of 3.0% is lower than the average State of Kansas unemployment rate of 3.2%. The following table details the regional unemployment rates, using data from the Kansas Department of Labor, for the months of August 2014 and August 2019.

Table 3.35: Kansas Region E Unemployment Rate, August 2014 and August 2019

County	August 2014	August 2019
Barber	3.1%	2.9%
Barton	3.3%	3.4%
Comanche	3.1%	3.2%
Edwards	3.1%	2.6%
Kiowa	3.1%	2.8%
Pawnee	3.7%	3.2%
Pratt	3.0%	2.8%
Stafford	4.1%	3.1%

Source: Kansas Department of Labor

3.13 – Climate Change

For hazards related to weather patterns, climate change should be considered as it may cause significant changes in patterns and event frequency. There is a scientific consensus that climate change is occurring, and recent climate modeling results indicate that extreme weather events may become more common. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events, including:

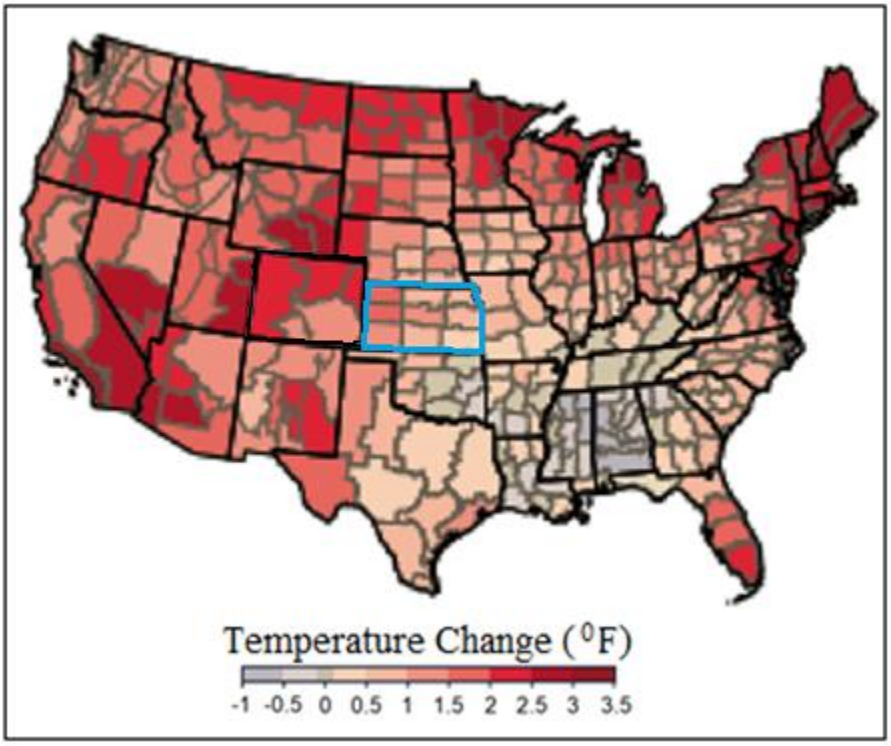
- Longer and hotter heat waves
- An increased risk of wildfires
- Higher wind speeds
- Greater rainfall intensity
- Increased tornado activity.

As climate modeling improves, future plan updates should include climate change as a factor in the ranking of natural hazards as these are expected to have a significant impact on Kansas Region E communities. Where applicable, and with proper scientific evidence, potential climate change factors will be addressed in subsequent sections for relevant identified hazards.

According to the United State Environmental Protection Agency (USEPA) "What Climate Change Means for Kansas" (August 2016), "In the past century, most of the state has warmed by at least half a degree (F). The soil is becoming drier. Rainstorms are becoming more intense, and floods are becoming more severe. Warming winters and changes in the timing and size of rainfall events have altered crop yields. In the coming decades, summers are likely to become increasingly hot and dry, creating problems for agriculture and possibly human health."

The following map, from the USEPA Climate Change Indicators in the United States, illustrates modeled temperature changes during the last century.

USEPA Modeled Temperature Changes During Last Century



Concerning potential impacts on agriculture, the report states "Rising temperatures, drier soils, and decreasing water availability are likely to present challenges for Kansas's farms. Yields would decline by about 50 percent in fields that can no longer be irrigated. Even where ample water is available, higher temperatures would reduce yields of corn. Increased concentrations of carbon dioxide, however, may increase yields of wheat and soybean enough to offset the impact of higher temperature. Although warmer and shorter winters may allow for a longer growing season, they may also promote the growth of weeds and pests, and shorten the dormancy for many winter crops, which could increase crop losses during spring freezes. The early flowering of winter wheat could have negative repercussions on livestock farmers who depend on it for feed. Livestock themselves may also be affected by more intense heat waves and lack of water. Hot weather causes cows to eat less, grow more slowly, and produce less milk, and it can threaten their health."

Concerning potential impacts on rainfall, flooding, and drought, the report states "Although summer droughts are likely to become more severe, floods may also intensify. During the last 50 years, the amount of rain falling during the wettest four days of the year has increased about 15 percent in the Great Plains. River levels associated with flooding have increased in eastern Kansas. Over the next several decades, the amount of rainfall during the wettest days of the year is likely to continue to increase, which would increase flooding."

Concerning potential impacts on tornados, the report states "Scientists do not know how the frequency and severity of tornados will change. Rising concentrations of greenhouse gases tend to increase humidity, and thus atmospheric instability, which would encourage tornados. But wind shear is likely to decrease, which would discourage tornados. Research is ongoing to learn whether tornados will be more or less

frequent in the future. Because Kansas experiences about 100 tornados a year, such research is closely followed by meteorologists in the state."

Concerning potential impacts on human health, the report states "By 2050, Kansas is likely to have four times as many days above 100°F. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor. The elderly may be particularly prone to heat stress and other heat-related health problems, including dehydration, cardiovascular strain, and respiratory problems. Those with low incomes may be particularly vulnerable due to a lack of air conditioning. Power failures due to severe weather can also present risks, especially in lightly populated areas where access to the necessary support services may be limited."

4.0 Hazard Profiles

4.1 – Introduction

The ultimate purpose of this HMP is to minimize the loss of life and property. To accomplish this, all relevant hazards and vulnerabilities the region faces have been identified. Once this identification has been completed, Kansas Region E and all participating jurisdictions can use the accumulated data to assist in the development of and prioritization of mitigation action to defend against these potential risks.

4.2 – Methodology

Each hazard that has historically, or could potentially, affect Kansas Region E is reviewed and discussed in detail. In general, each hazard details the following information:

- Location and Extent
- Previous Occurrences
- Hazard Probability Analysis
- Vulnerability Assessment

Data sets used for this HMP were designed to follow the lead of the 2018 State of Kansas Hazard Mitigation Plan. Ten-year data sets from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) (2009 to 2018, with 2009 and 2018 being full data set years) were used, where applicable, for hazard occurrence and impact data. Ten-year data sets from the United States Department of Agriculture (USDA) Risk Management Agency (2009 to 2018, with 2013 and 2018 being full data set years) were used to determine agricultural losses. The ten-year data set was used to reflect the change in the climate and more accurately depict changes in the region. Where data sets were unavailable for a hazard, local reporting from participating jurisdictions was relied upon.

In addition, to ensure compliance with EMAP standards, a hazard consequence analysis was conducted for each hazard detailing the following potential impacts:

- Health and Safety of the Public
- Health and Safety of Responders
- Continuity of Operations; Property, Facilities, and Infrastructure
- Environment
- Economic Conditions
- Public Confidence in the Jurisdiction's Governance.

4.3 – Declared Federal Disasters

Historical events of significant magnitude or impact can result in a Secretarial or Presidential Disaster Declaration. The MPC reviewed the historical federal disaster declarations to assist in hazard identification. Since the approval of the previous Kansas Region E hazard mitigation plan in 2014, there have been four federal disaster declarations for the region, as follows:

- DR 4449: Declared on June 20, 2019 – Severe Storms, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides
- DR 4417: Declared on February 25, 2019 – Severe Storms, Straight-Line Winds and Flooding
- DR 4403: Declared on October 19, 2018 – Severe Storms, Straight-Line Winds and Flooding
- DR 4230: July 20, 2015 – Severe Storms, Tornados, Straight-line Winds, and Flooding

In addition, since the 2014 plan, there have be two Fire Management Assistance Declarations for the region, as follows:

- FM5176: Declared on March 6, 2017 – Comanche County Fire
- FM5120: Declared on March 23, 2016 – Anderson Creek Fire

For the 20-year period from 2009 to 2018, Kansas Region E has had 23 federal disaster declarations and two Fire Management Assistance declarations. These declarations included the following identified hazards:

- Flooding
- Ice Storm
- Landslides
- Severe Storms
- Straight-Line Winds
- Severe Winter Storms
- Tornados
- Wildfires

Information on past declared disasters are presented in the subsequent, relevant sections.

4.4 – Identified Potential Hazards

Based on the above data, and data contained in previous mitigation plans, Kansas Region E's MPC met to discuss previously identified hazards and deliberate on any changes or additions. Based on this review, no changes, additions or subtractions were indicated for any identified hazard. Additionally, a thorough and comprehensive revision of data for each hazard was completed as part of this plan update.

The MPC confirmed sixteen natural hazards that may impact Kansas Region E, as listed below:

- Agricultural Infestation
- Dam/Levee Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Temperatures
- Flood
- Hailstorm
- Land Subsidence

- Landslide
- Lightning
- Soil Erosion and Dust
- Tornado
- Wildfire
- Wind Storm
- Winter Storm

Additionally, the MPC confirmed six man-made hazards that may impact Kansas Region E, as listed below:

- Civil Disorder
- Hazardous Materials Incident
- Major Disease Outbreak
- Radiological Event
- Terrorism/Agri-Terrorism
- Utility/Infrastructure Failure

Based on discussion with the MPC, a lack of identified risk or history, and geographic improbability, numerous FEMA identified hazards such as coastal erosion, hurricane, tsunami were not included in the scope of this plan.

4.5 – Hazard Planning Significance

Previous planning efforts used the calculated priority risk index (CPRI) methodology to assign a planning significance to each of the identified hazards. CPRI considers the following four elements of risk:

- Probability of an Impactful Event
- Magnitude/Severity
- Warning Time
- Duration

Each element was then assigned a number based on pre-established rating parameters. The following tables provide a summary for each of the risk elements, including a rationale behind each numerical rating.

Table 4.1: CPRI Element Ratings

CPRI Element	Rating Number and Definition			
	1	2	3	4
Probability	Unlikely (10% chance of occurrence)	Occasional (20% chance of occurrence)	Likely (33% chance of occurrence)	Highly Likely (100% chance of occurrence)
Magnitude	Negligible (Minor injuries and <10% of property severely damaged)	Limited (Multiple injuries and 10-25% of property severely damaged)	Critical (Multiple disabling injuries and 25-50% of property severely damaged)	Catastrophic (Multiple deaths and 50% of property severely damaged)
Warning Time	24+ hours	12-24 hours	6-12 hours	<6 hours
Duration	< 6 hours	< 1 day	< 1 week	1 week +

Using the rankings, the following weighted formula was used to determine each hazard's CPRI:

(Probability x 0.45) + (Magnitude/Severity x 0.30) + (Warning Time x 0.15) + (Duration x 0.10)

Each planning significance category was assigned a CPRI range, with a higher score indicating greater planning criticality. The following table details planning significance CPRI ranges.

Table 4.2: CPRI Planning Significance Range

	CPRI Range	
Planning Significance	**Low CPRI**	**High CPRI**
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

The terms high, moderate and low indicate the level of planning significance for each hazard, and do not indicate the potential impact of a hazard occurring. Hazards rated with moderate or high planning significance were more thoroughly investigated and discussed due to the availability of data and historic occurrences, while those with a low planning significance were generally addressed due to lack of available data and historical occurrences. The following table shows the CPRI ratings for Kansas Region E.

Table 4.3: Kansas Region E Natural Hazard CPRI Planning Significance

Hazard	Probability	Magnitude/Severity	Warning Time	Duration	CPRI
Agricultural Infestation	1.5	2.0	1.0	4.0	1.8
Dam and Levee Failure	1.5	2.5	2.5	3.5	2.1
Drought	2.5	2.0	1.0	4.0	2.2
Earthquake	1.0	1.5	4.0	1.0	1.6
Expansive Soils	1.5	1.0	1.5	3.5	1.5
Extreme Temperature	2.5	2.0	1.5	3.5	2.2

Table 4.3: Kansas Region E Natural Hazard CPRI Planning Significance

Hazard	Probability	Magnitude/Severity	Warning Time	Duration	CPRI
Flood	3.5	3.0	2.5	3.0	3.0
Hailstorm	4.0	3.0	3.5	1.0	3.1
Land Subsidence	1.5	1.0	2.0	3.5	1.6
Landslide	1.0	1.0	3.5	1.5	1.4
Lightning	2.5	1.5	3.5	1.0	2.1
Soil Erosion & Dust	2.5	1.5	1.0	4.0	2.0
Tornado	3.5	3.5	4.0	1.0	3.2
Wildfire	3.5	2.5	4.0	2.0	3.0
Windstorm	4.0	3.0	3.0	2.0	3.2
Winter Storm	4.0	3.0	2.0	3.5	3.2

Table 4.4: Kansas Region E Man-Made Hazard CPRI Planning Significance

Hazard	Probability	Magnitude/Severity	Warning Time	Duration	CPRI
Civil Disorder	1.0	2.0	4.0	1.0	1.7
Hazardous Materials Event	1.0	2.0	4.0	2.0	1.8
Major Disease Outbreak	1.5	2.0	1.0	4.0	1.8
Radiological Event	1.0	1.0	3.5	4.0	1.6
Terrorism, Agri-Terrorism	1.0	2.0	3.5	1.5	1.7
Utility / Infrastructure Failure	3.0	2.0	4.0	3.0	2.7

The average CPRI for each identified hazard remained the same as the calculated CPRI for the 2014 planning effort, where individual county rankings were combined into a regional ranking.

4.6 – Hazard Profiles

44 CFR 201.6(c)(2)(i) A description of the type, 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.

Each identified hazard is profiled in the subsequent sections, with the level of detail varying based on available information. Sources of information are cited in the detailed hazard profiles below.

With each update of this plan, new information will be incorporated to provide for better evaluation and prioritization of the hazards.

The following hazards are presented in alphabetical order, and not by planning significance, for ease of reference. Additionally, man-made hazards are presented, again in alphabetical order, after natural hazards.

4.7 – Agricultural Infestation

Agricultural infestation is the naturally occurring infection of vegetation, crops or livestock with insects, vermin (to include lice, roaches, mice, coyote, fox, fleas, etc.), or diseases that render the crops or livestock unfit for consumption or use. The levels and types of agricultural infestation will vary according to many factors, including cycles of heavy rains and drought. A certain level of agricultural infestation is normal; however, infestation becomes an issue when the level of an infestation escalates suddenly, or a new infestation appears, overwhelming normal control efforts. Infestation of crops or livestock can pose a significant risk to state and local economies due to the dominance of the agricultural industry.

Onset of agricultural infestation can be rapid. Controlling an infestation's spread is critical to limiting impacts through methods including quarantine, culling, premature harvest and/or crop destruction when necessary. Duration is largely affected by the degree to which the infestation is aggressively controlled but is generally more than one week. Maximizing warning time is also critical for this hazard and is most affected by methodical and accurate monitoring and reporting of livestock and crop health and vigor, including both private individuals and responsible agencies.

4.7.1 –Location and Extent

The entire planning area may be affected by agricultural infestation. While rural areas within the region are more susceptible to crop and livestock infestation, urban and suburban areas are also at risk due to landscaping, urban gardens and parks, all of which add value to homes and communities, may be susceptible to damage or loss. The magnitude and severity of an agricultural infestation is relative to the type of infestation. A foreign animal disease like foot and mouth could potentially cause the economy to crumble, whereas an infestation of fleas would be manageable. The MPC has determined that the magnitude of this hazard in the planning area would be limited, as most infestations are manageable in scope.

Animal Disease

Of key concern regarding this hazard is the potential introduction of a rapid and economically devastating foreign animal disease, including Foot and Mouth disease and Bovine Spongiform Encephalopathy (BSE) disease. Because Kansas is a major cattle state, with cattle raised locally as well as imported into the state, the potential for highly contagious diseases such as these is a continuing, significant threat. The loss of production, death of animals, and other lasting problems resulting from an outbreak could cause continual and severe economic losses, as well as widespread unemployment. It would affect not only farmers, ranchers, and butchers, but also support and related industries

Of particular concern are Confined Animal Feeding Operations (CAFO) facilities, defined as facilities with 300 or more animal units. The CAFO facilities are regulated by the Kansas Department of Health & Environment (KDHE), Bureau of Water, and Livestock Waste Management. The CAFO includes beef, dairy, sheep, swine, chicken, turkey, and horses. The following is a list of the number of CAFOs per county, using the latest available data, in Kansas Region E:

- Barber County: 6
- Barton County: 14
- Comanche County: 3
- Edwards County: 13
- Kiowa County: 2
- Pawnee County: 15
- Pratt County: 14
- Stafford County: 12

Knowing where diseased and at-risk animals are, where they've been and when, is important to ensuring a rapid response when animal disease events take place. The Kansas Department of Agriculture (KDA), Division of Animal Health monitors and reports on animal reportable diseases. Producers are required by state law to report any of the reportable animal diseases.

Crop Pests and Diseases

Many factors influence disease development in plants, including hybrid/variety genetics, plant growth stage at the time of infection, weather (e.g., temperature, rain, wind, hail, etc.), single versus mixed infections, and genetics of the pathogen populations.

Field crops in the region are also subject to various types of infestation. According to KDA, Plant Protection and Weed Control Division, the following are the highest risk crop pests to this region and the potentially impacted crop:

- Aspergillus Ear Rot (Alfatoxin): Corn
- Austro-Asian Rust: Soybean
- Black Stem Rust, Blast: Wheat
- South American strains, Stripe Rust, Leaf Rust, Karnal: Wheat

Infestation is not only a risk to crops in the field, but insect infestation can also cause major losses to stored grain. It is estimated that damage to stored grain by the lesser grain borer, rice weevil, red flour beetle, and rusty grain beetle costs the United States about $500 million annually.

Tree Pests

According to the KDA, Plant Protection and Weed Control Division, the following are the highest risk plant pests by host to Kansas Region E:

- Emerald Ash Borer (EAB): Ash Trees
- Asian Longhorned Beetle: Maple, Birch, Willow, Mimosa, Ash, Sycamore & Poplar Trees
- Thousand Cankers: Walnut Trees

As of this plan, neither the Asian Longhorned Beetle nor Thousand Cankers have been detected in Kansas.

As of this plan, the EAB has been discovered in numerous Kansas countries to the east of Kansas Region E. However, no instances of EAB have been detected in Kanas Region E or in any adjacent counties.

Wildlife Pests

The region's farmers also lose a significant amount of crops each year as a result of wildlife foraging. This can be particularly problematic in areas where natural habitat has been diminished or in years where weather patterns such as early/late frost deep snow, or drought has caused the wild food sources to be limited. Also, of concern are the following wildlife diseases:

- Chronic Wasting Disease (CWD), affecting deer and captive elk populations.
- Hemorrhagic Disease (HD), affecting white-tailed deer

In a continuing effort to monitor the prevalence and spread of CWD in Kansas deer, the Kansas Department of Wildlife, Parks and Tourism (KDWPT) has collected and tested samples from 360 deer in 2018 and 2019. Thirty-seven of those samples were confirmed positive. The 37 confirmed positives came from deer taken in Cheyenne, Rawlins, Decatur, Norton, Phillips, Smith, Thomas, Sheridan, Gove, Rooks, Osborne, Scott, Lane, Hamilton, Haskell, Hodgeman, Ford, Edwards, Stafford, Reno, and Pratt counties. While most positives are still coming from northwest Kansas, new counties were added to the list this year, including several that show the disease's spread to the south and east.

These diseases can seriously damage the populations of the captive deer and elk farms and the wild deer populations but also affect the annual $350 million-dollar regional and statewide hunting economy.

4.7.2 – Previous Occurrences

There have been no major reported or recorded agricultural infestations, above what is considered a normal level, for Kansas Region E.

Crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of agricultural infestation on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years) for the region indicates 120 claims on 13,286 acres for $1,725,410.

Table 4.5: USDA Risk Management Agency Cause of Loss
Indemnities 2009-2018, Agricultural Infestation

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	16	1,798	$129,230
Barton	42	7,197	$583,435
Comanche	13	1,439	$75,418
Edwards	20	2,167	$148,174
Kiowa	20	2,631	$161,451
Pawnee	38	3,066	$308,928
Pratt	37	5,054	$419,855
Stafford	34	4,488	$478,266

Source: USDA Farm Service Agency

4.7.3 – Hazard Probability Analysis

Kansas Region E experiences agricultural losses every year because of insects, vermin or diseases that impact plants and livestock. Data from the UDSA Risk Management Agency indicates that there has been at least one claimed incident of agricultural infestation for Kansas Region E for the period 2009 through 2018. Using the binomial probability equation (number of years with an event divided by total number of years in reporting period) we derive a probability 100% of a reportable agricultural infestation event in a given year. However, the large majority of events are expected to be small and limited in scope.

4.7.4 – Vulnerability Assessment

Regional populations and facilities are not directly vulnerable to losses as a result of agricultural infestation. The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. The USDA Risk Management Agency provides information on insured crop losses related to identified hazards, with data from the ten-year period of 2009 to 2018 (with 2009 and 2018 being full data set years) used for analysis. The higher the percentage loss, the higher the potential vulnerability the county has to agricultural infestation events.

Table 4.6: Agricultural Infestation Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	180	0.03%	$93,568,000	$12,923	0.01%
Barton	557,961	720	0.13%	$365,672,000	$58,344	0.02%
Comanche	453,556	144	0.03%	$51,803,000	$7,542	0.01%
Edwards	392,025	217	0.06%	$228,780,000	$14,817	0.01%
Kiowa	442,981	263	0.06%	$78,281,000	$16,145	0.02%
Pawnee	474,275	307	0.06%	$362,349,000	$30,893	0.01%
Pratt	465,191	505	0.11%	$271,307,000	$41,985	0.02%
Stafford	493,694	449	0.09%	$198,573,000	$47,827	0.02%

Source: USDA

This table only reflects insured losses that were claimed. According to the 2017 Kansas Crop Insurance Profile Report issued by the USDA Risk Management Agency, 75-94% percent of major Kansas row crops were insured. Data regarding the number or value of livestock and wildlife lost to disease or infestation was not available for this planning effort.

In addition, threats have been identified which, while currently not impacting Kansas, may present a future risk. According to the KDA, Plant Protection and Weed Control Division the following table lists the highest risk plant pests to Kansas.

Table 4.7: Potential High-Risk Plant Pests

Pest (Disease Insect, or weed)	Crop or Host Plant	Current Distribution	Type of Loss
Rust, Austro-Asian	Soybean	Australia, Japan, Pacific, Gulf of Mexico	Direct Loss to production
Aspergillus ear rot (Alfatoxin)	Corn	Worldwide, endemic to Kansas	Toxin renders the grain unusable
Black Stem Rust UG99 strain	Wheat	Africa, Asia	Direct Loss to production
Blast – South American strains	Wheat	South America	Direct Loss to production
Stripe Rust (new races)	Wheat	North America	Direct Loss to production
Leaf Rust (new races)	Wheat	North America	Direct Loss to production
Karnal Bunt	Wheat	Asia, Mexico, Arizona	International export quarantines, degradation of flour quality
Thousand Cankers	Walnut	Western US states and PA, VA, Tenn	Death of municipal trees, loss of nut crop, loss of timber
Emerald Ash Borer	Ash	Eastern Kansas	Death of trees. Cost of removal and re-vegetation.
Asian Longhorned Beetle	Maples, Birches, Willows, Mimosa, Ash, Sycamore, Poplar trees	Small parts of Ohio, New York, and Massachusetts	Death of trees. Cost of removal and re-vegetation.
Hydrilla	Water Bodies	Southern U.S. and one park pond in Olathe	Economic and environmental.

4.7.5 – Impact and Consequence Analysis

As per EMAP standards, the information in the following table provides the Consequence Analysis.

Table 4.8: Agricultural Infestation Consequence Analysis

Subject	Impacts of Agricultural Infestation
Health and Safety of the Public	Impact in the area would be minimal. If the infestation is unrecognized, then there is the potential for the food supply to be contaminated.
Health and Safety of Responders	Impact would be minimal with protective clothing, gloves, etc as these diseases cause no risk to humans.
Continuity of Operations	Minimal expectation of execution of the COOP.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the incident area is minimal to non-existent.
Environment	Impact could be severe to the incident area, specifically, plants, trees, bushes, and crops.
Economic Conditions	Impacts to the economy will depend on the severity of the infestation. The potential for economic loss to the community and state could be severe if the infestation is hard to contain, eliminate, or reduce. Impact could be minimized due to crop insurance.
Public Confidence in the Jurisdiction's Governance	Confidence could be in question depending on timeliness and steps taken to warn the producers and public, and treat/eradicate the infestation.

4.8 – Dam and Levee Failure

A dam is a barrier across flowing water that obstructs, directs or slows down the flow, often creating a reservoir, lake or impoundments. Common reasons for dam failure include:

- Flooding
- Sub-standard construction materials/techniques
- Spillway design error
- Geological instability caused by changes to water levels during filling or poor surveying
- Sliding of a mountain into the reservoir
- Poor maintenance, especially of outlet pipes
- Human, computer or design error
- Internal erosion, especially in earthen dams
- Earthquakes

A levee is an artificial barrier, usually an earthen embankment, constructed along rivers to protect adjacent lands from flooding. Common reasons for levee failure include:

- Surface erosion due to water velocities
- Subsurface actions
- Flood waters exceeding the design capacity of the structure

4.8.1 – Dam Location and Extent

In Kansas, the State has regulatory jurisdiction over non-federal dams that meet the following definition of a "jurisdictional" dam as defined by K.S.A. 82a-301 et seq, and amendments thereto:

- *any artificial barrier including appurtenant works with the ability to impound water, waste water or other liquids that has a height of 25 feet or more; or has a height of six feet or greater and also has the capacity to impound 50 or more acre feet. The height of a dam or barrier shall be determined as follows: (1) A barrier or dam that extends across the natural bed of a stream or watercourse shall be measured from the downstream toe of the barrier or dam to the top of the barrier or dam; or (2) a barrier or dam that does not extend across a stream or watercourse shall be measured from the lowest elevation of the outside limit of the barrier or dam to the top of the barrier or dam.*

The KDA Division of Water Resources (KDA-DWR) is the State agency responsible for regulation of jurisdictional dams. Within the DWR, the Water Structures Program has the following responsibilities:

- Reviewing and approving of plans for constructing new dams and for modifying existing dams
- Ensuring quality control during construction,
- Monitoring dams that, if they failed, could cause loss of life, or interrupt public utilities or services

The KDA-DWR uses a three-tiered classification system to describe the potential risk and severity associated with dam failure, with the tiers relating to potential downstream impact rather than the physical condition of the dam.

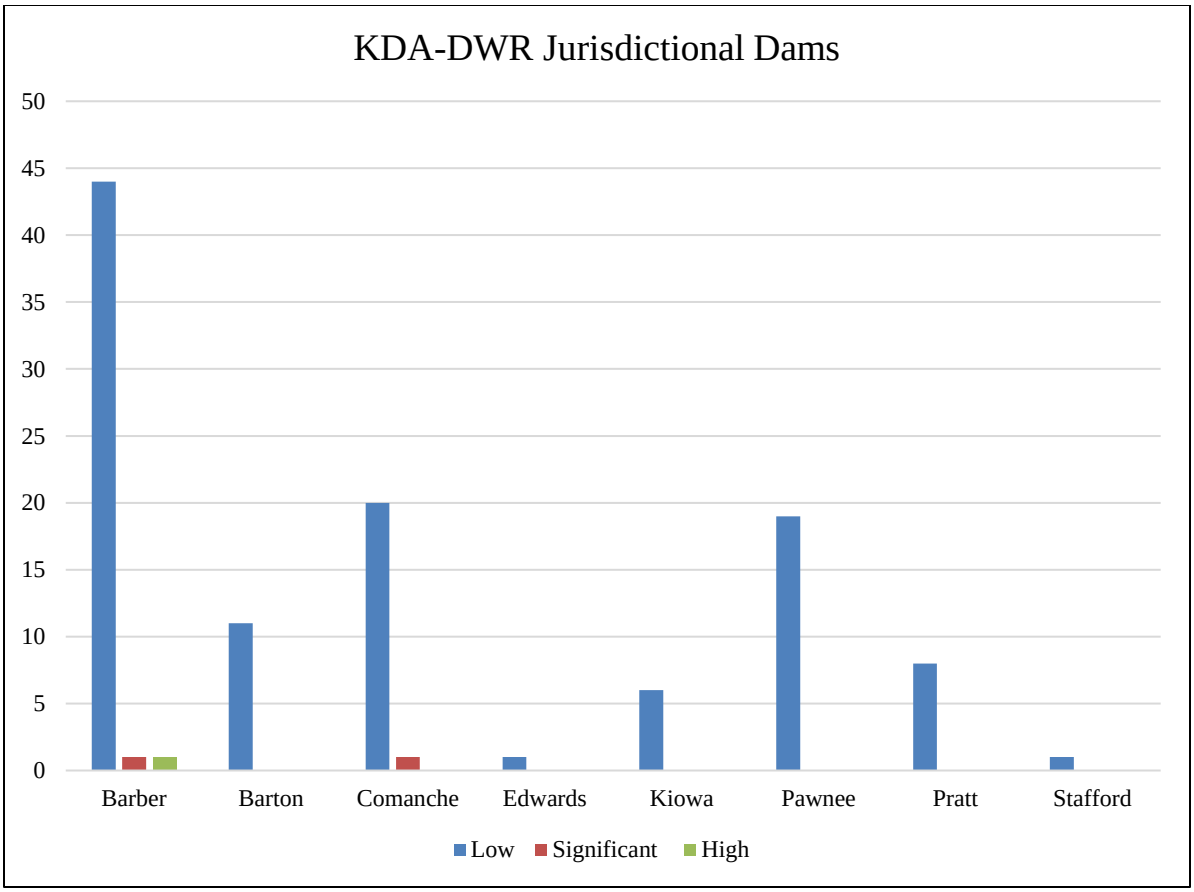
- **High Hazard (Class C):** Dams assigned the high hazard-potential classification are those where failure could result in any of the following: extensive loss of life, damage to more than one home, damage to industrial or commercial facilities, interruption of a public utility serving a large number of customers, damage to traffic on high-volume roads that meet the requirements for hazard class C dams or a high-volume railroad line, inundation of a frequently used recreation facility serving a relatively large number of persons, or two or more individual hazards described in hazard class B. Emergency Action Plans (EAPs) are required for all High Hazard Dams.
- **Significant Hazard (Class B):** Dams assigned the significant hazard-potential classification are those dams where failure could endanger a few lives, damage an isolated home, damage traffic on moderate volume roads that meet the requirements for hazard class B dams, damage low-volume railroad tracks, interrupt the use or service of a utility serving a small number of customers, or inundate recreation facilities, including campground areas intermittently used for sleeping and serving a relatively small number of persons.
- **Low Hazard (Class A):** Dams assigned the low hazard-potential classification are those where failure could damage only farm or other uninhabited buildings, agricultural or undeveloped land including hiking trails, or traffic on low-volume roads that meet the requirements for hazard class A dams.

According to the KDA-DWR, there are 113 jurisdictional dams in Kansas Region E. These dams are classified as follows.

Table 4.9: Kansas Region E KDA-DWR Jurisdictional Dams

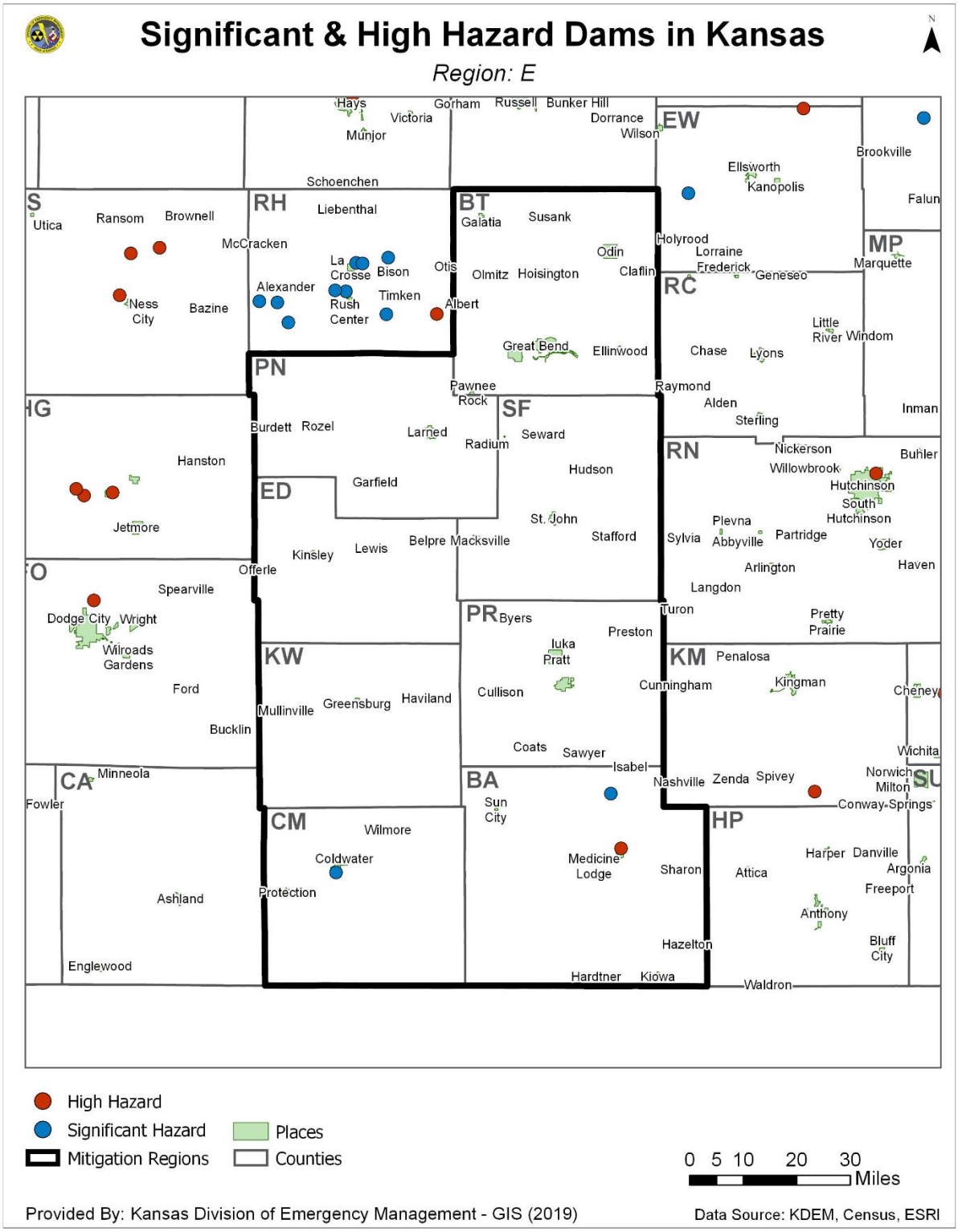
County	Low	Significant	High	High Hazard Without EAP
Barber	44	1	1	0
Barton	11	0	0	0
Comanche	20	1	0	0
Edwards	1	0	0	0
Kiowa	6	0	0	0
Pawnee	19	0	0	0
Pratt	8	0	0	0
Stafford	1	0	0	0

Source: KDA-DWR

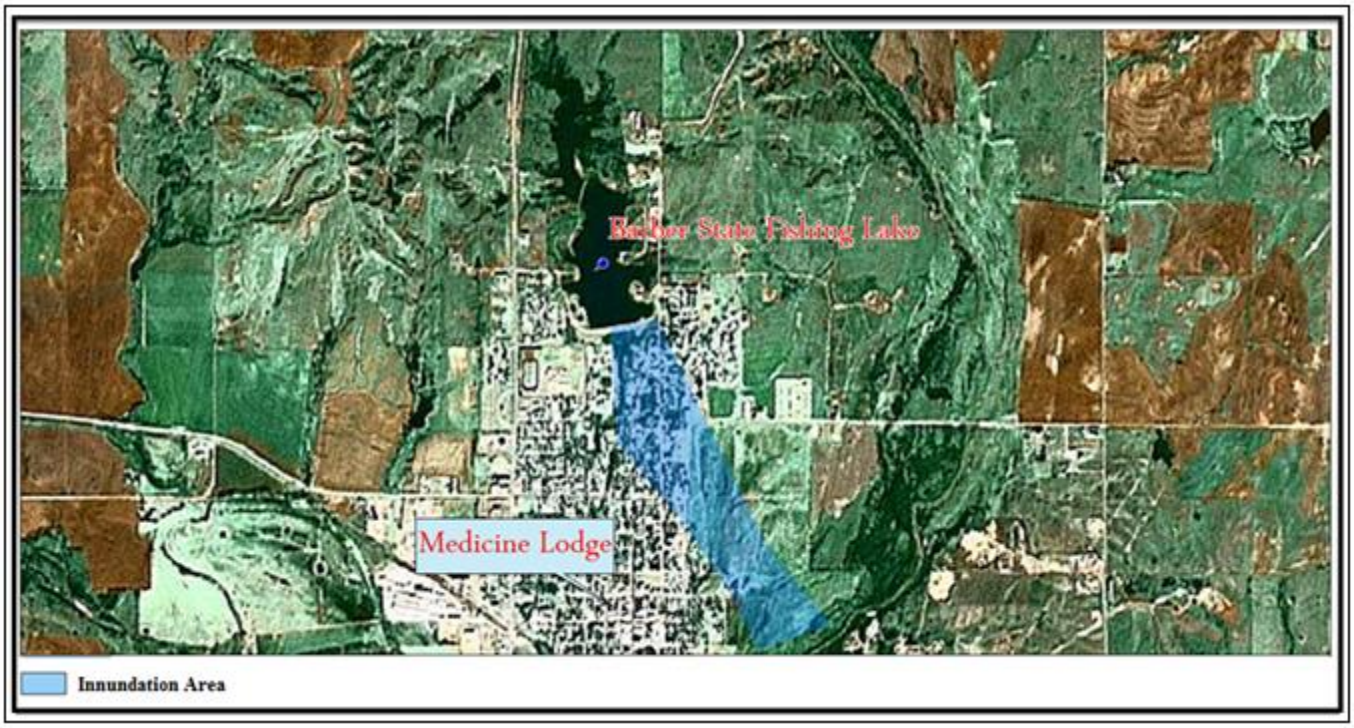


The following maps show all identified dams within Kansas Region E with a Significant or High classification, and available inundation and location mapping. Please note that information related to dams may have been classified and unable for review.

Kansas Region E Significant and High Hazard Dams

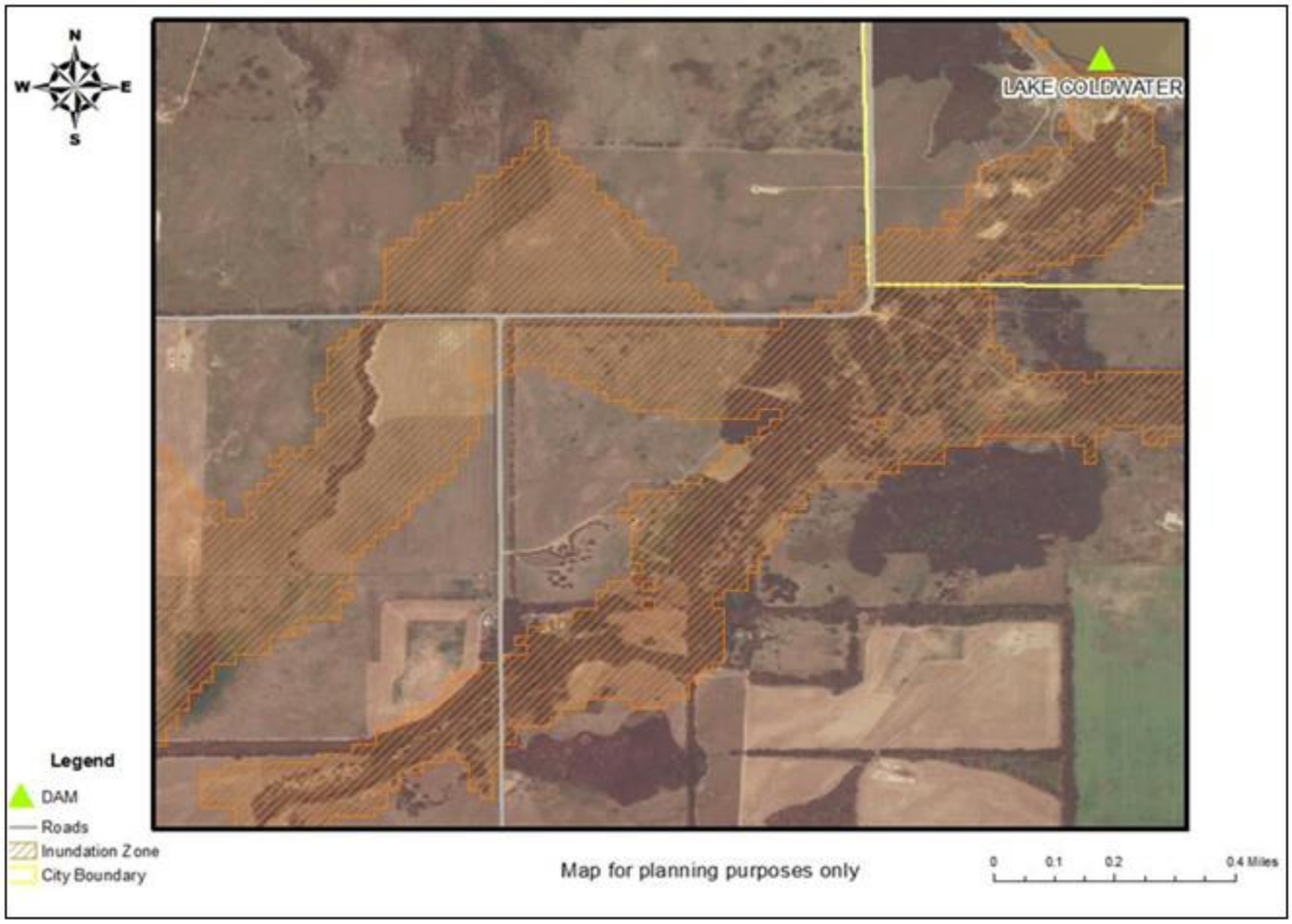


Barber County Lake Inundation Map (Barber County)



Source: KDEM

Coldwater Lake Inundation Map (Comanche County)



Source: KDEM

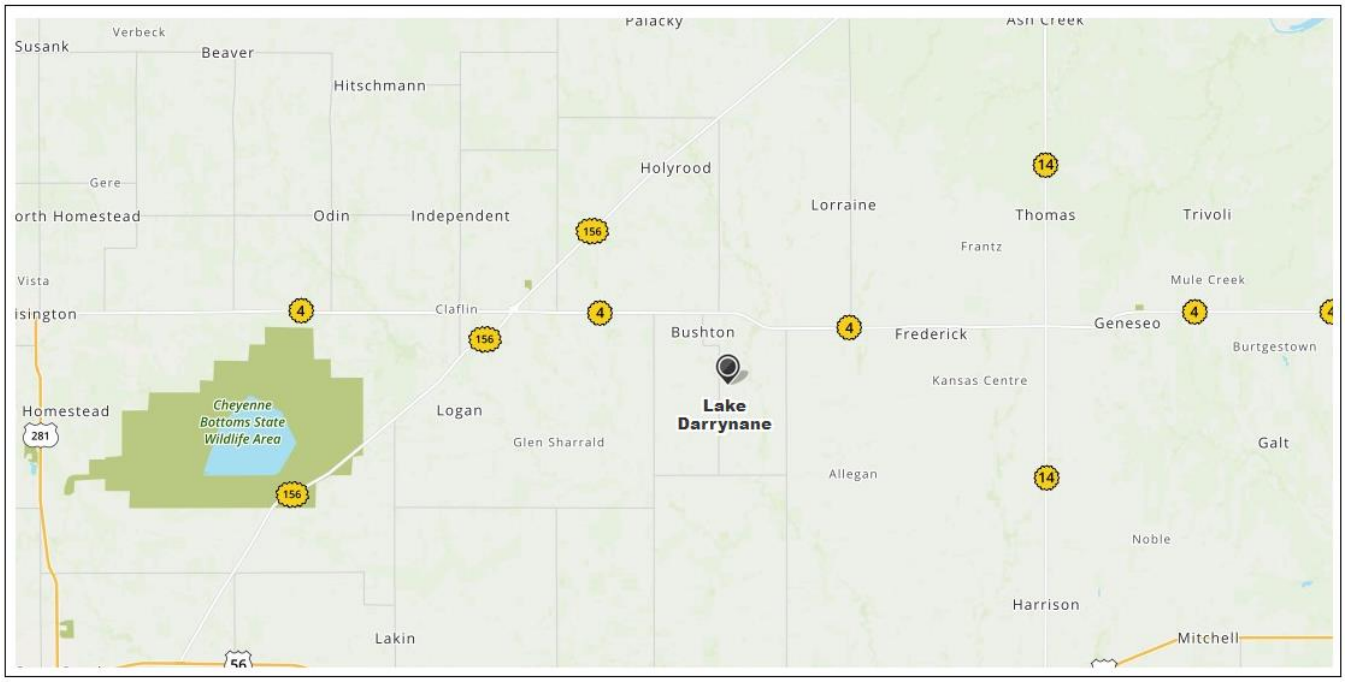
In addition, the KDA-DWR indicates that there is one federally operated reservoir within Kansas Region E.

Table 4.10: Kansas Region E Federally Operated Reservoirs

County	Federal Reservoir Name	Operating Agency
Stafford	Lake Darrynane	United States Fish and Wildlife Service

Source: KDA-DWR

The following map details the location of Lake Darryanne in Stafford County:



There are no identified dams located in bordering Oklahoma counties that could impact the region in the event of a failure.

There are no dams identified in any adjacent regions that could impact the region in the event of a failure.

4.8.2 – Levee Location and Extent

As there is no one, comprehensive list of all levees within the region, two sources of data were reviewed to determine a list of all known levees. These sources are:

- The U.S. Army Corps of Engineers (USACE) Integrated National Levee Database (NLD), containing levees enrolled in the USACE National Levee Safety Program (NLSP).
- The FEMA National Levee Inventory Report (NLIR)

According the USACE Integrated NLD, there are 10 levees in the NLSP in Kansas Region E. The following table provides available information on these levees.

Table 4.11: Kansas Region E USACE NLD Levees

County(ies)	Jurisdiction(s)	Name	Waterway	Levee Miles	Leveed Area in Square Miles	Last Inspection Date
Barber	Medicine Lodge	LBA-0005	-	0.26	0.022	-
Barber	-	LBA-0010	-	0.63	0.17	-
Barton	-	Agricultural Levees 1	-	0.33	0.081	-
Barton	-	Agricultural Levees 3	-	0.31	0.068	-

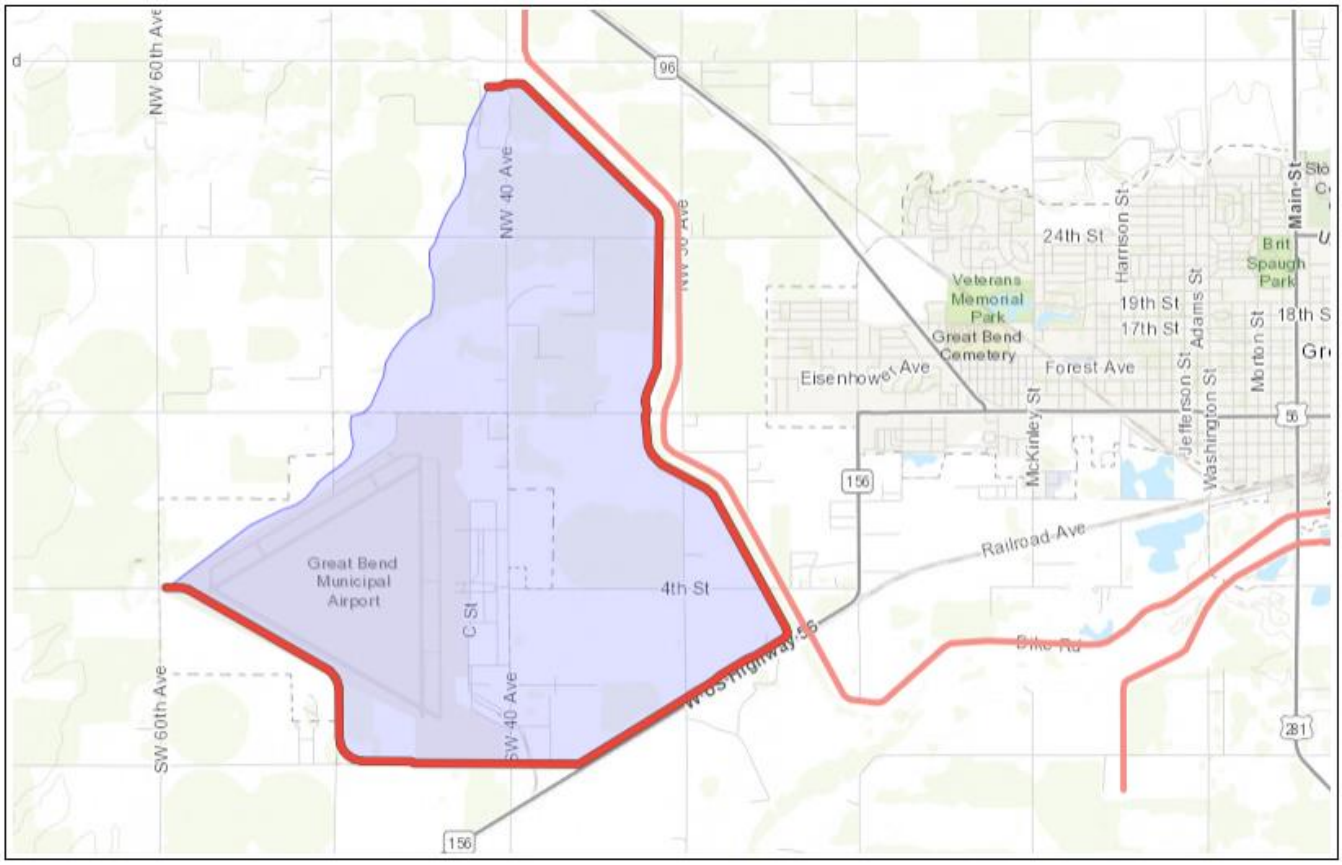
Table 4.11: Kansas Region E USACE NLD Levees

County(ies)	Jurisdiction(s)	Name	Waterway	Levee Miles	Leveed Area in Square Miles	Last Inspection Date
Barton	-	Agricultural Levees 4	-	0.97	0.47	-
Barton	Great Bend	Great Bend Levee Little Walnut	Arkansas River	8.31	6.82	05/24/13
Barton	Great Bend	Great Bend Levee North Side and Walnut NW	Arkansas River	12.33	35.02	05/24/13
Barton	Great Bend	Great Bend Levee South Side	Arkansas River	5.72	10.55	05/24/13
Barton	Albert	LBT-0001	-	0.88	0.33	-
Pawnee	Larned	Larned Kansas Levee	Pawnee and Arkansas Rivers	1.9	1.44	08/24/15

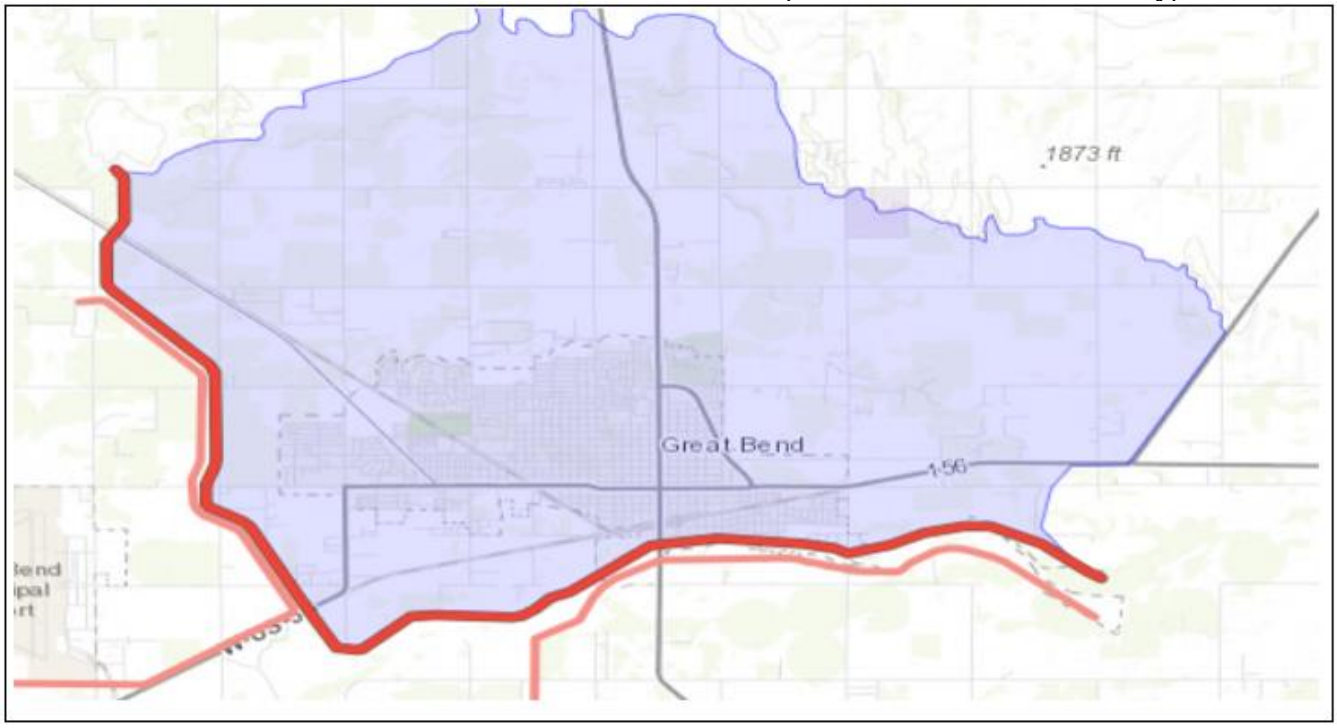
Source: USACE
-: Data unknown

The following maps detail select individual levees. Additional, both the county and jurisdiction for the levee are noted in parenthesis.

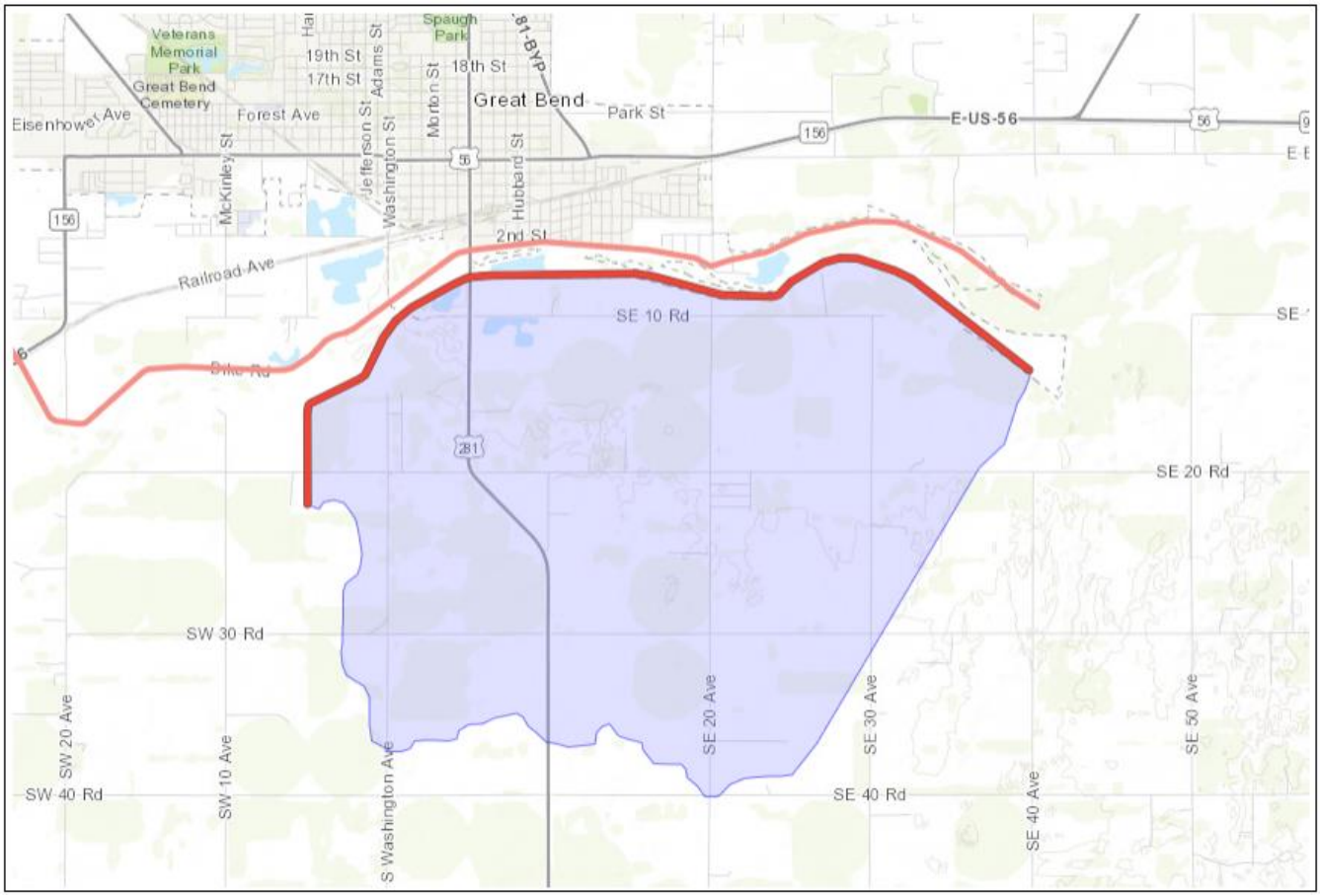
Great Bend Levee Little Walnut W & Airport Ring (Great Bend, Barton County)



Great Bend Levee North Side & Walnut NW (Great Bend, Barton County)



Great Bend Levee South Side (Great Bend, Barton County)



4.8.3 – Previous Occurrences

Kansas Region E has one recorded dam failure for the 20-year period from 1999-2018.

Table 4.12: Kansas Region E Dam Incidents

County	Dam Name	Incident Type	Failure	Incident Date	Deaths
Pratt	Pratt County Lake Dam	Piping	No	06/02/1995	None Reported

Source: National Inventory of Dams

There have been no reported levee failures in Kansas Region E in the past 20 years.

4.8.4 – Hazard Probability Analysis

Due to the variability of the size and construction of the dams in Region E, estimating the probability of dam failure is difficult on any scale greater than a case-by-case basis. Historically, the limited available data indicates there has been one reported dam failure event in Kansas Region E over a 20-year period. Using the binomial probability equation (number of years with an event divided by total number of years

in reporting period) we derive a probability 5% of a dam failure in a given year. However, it is worth noting that the historically reported event did not in a failure, had no loss of life, and no property damages.

Historically, the limited available data indicates there have been no reported levee failure events in Kansas Region E over a 20-year period. Using the binomial probability equation, we derive a probability of 0% for levee damages in a given year. However, because past non-occurrence does not guarantee future non-occurrence, both federal and nonfederal levees may be damaged in future catastrophic regional flood events.

4.8.5 – Vulnerability Assessment, Dams

Following the metric established in the State of Kansas 2018 Hazard Mitigation Plan, an analysis of vulnerability to dam failure was completed by points being assigned to each type of dam and then aggregated for a total point score for each county. This analysis does not intend to demonstrate vulnerability in terms dam structures that are likely to fail, but rather provides a general overview of the counties that have a high number of dams, with weighted consideration given to dams whose failure would result in greater damages. Points were assigned as follows:

- Low Hazard Dams: 1 point
- Significant Hazard Dams: 2 point
- High Hazard Dams: 3 points
- High Hazard Dams without an EAP: 2 points
- Federal Reservoir Dams: 3 points.

Based on these categories, an awarded point total was determined for each participating county and a vulnerability rating assigned based on the following schedule.

Table 4.13: Dam Vulnerability Rating Schedule

	Low	Medium-Low	Medium	Medium-High	High
Awarded Point Range	0 – 26	27 – 50	51 – 100	101 – 200	201 - 327

The following table presents the dam failure vulnerability rating for each Kansas Region E participating county.

Table 4.14: Kansas Region E County Vulnerability Assessment for Dam Failure

County	Low Hazard Dams	Significant Hazard Dams	High Hazard Dams	High Hazard Dams Without EAP	Federal Reservoirs	Vulnerability Rating	Vulnerability Level
Barber	44	1	1	0		49	Medium-Low
Barton	11	0	0	0		11	Low
Comanche	20	1	0	0		22	Low
Edwards	1	0	0	0		1	Low
Kiowa	6	0	0	0		6	Low
Pawnee	19	0	0	0		19	Low
Pratt	8	0	0	0		8	Low

Table 4.14: Kansas Region E County Vulnerability Assessment for Dam Failure

County	Low Hazard Dams	Significant Hazard Dams	High Hazard Dams	High Hazard Dams Without EAP	Federal Reservoirs	Vulnerability Rating	Vulnerability Level
Stafford	1	0	0	0	1	4	Low

Source: Analysis by KDEM utilizing data from: Kansas Department of Agriculture, Division of Water Resources, Water Structures program; U.S. Army Corps of Engineers; Bureau of Reclamation; U.S. Army, U.S. Fish and Wildlife.

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential dam failure events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.15: Kansas Region E Population Vulnerability Data for Dam Failure

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

The following detail specific local concerns as related to dam failure:

- In Barber County, there are numerous downstream properties in and around the City of Medicine Lodge at risk in if the Barber State Fishing Lake Dam were to fail.
- In Comanche County, a dam breach of the Coldwater Lake Dam could potentially result in significant damage to approximately three residential structures, a golf course, a ball field complex, and surrounding agricultural land.
- In Stafford County, the Lake Darrynane Dam is owned and operated by the US Fish and Wildlife Service and is located within the Quivira National Wildlife Refuge boundaries. This High Hazard dam does not have an owner provided EAP or inundation maps available for review and evaluation.

4.8.6 – Vulnerability Assessment, Levees

Data was obtained from the USACE NLD to help determine the vulnerability of participating jurisdictions to potential levee failure. Available data includes:

- Number of people at risk
- Structures at risk
- Property value for structures at risk
- Levee safety action risk classification

Additionally, for the NFIP, FEMA will only recognize a levee system in its flood risk mapping effort that meet minimum design, operation, and maintenance standards as established by 44 CFR 65.10 – Mapping of Areas Protected by Levee Systems. In general, evaluated levees are assigned to one of these categories:

- **Accredited Levee:** Area behind the levee is mapped as a moderate-risk, with no mandatory flood insurance requirement.
- **To Be Accredited:** A levee system that has been approved for accreditation.
- **Provisionally Accredited Levee (PAL):** Area behind the levee is mapped as a moderate-risk, with no mandatory flood insurance requirement, for a two-year grace period while compliance with 44 CFR 65.10 is sought
- **Non-Accredited Levee:** Area behind the levee is mapped according to FEMA protocols, likely resulting in a high-risk area designation and associate flood insurance requirements
- **To Be Non-Accredited:** A levee system that no longer meets the requirements stipulated in 44 CFR 65.10 and is scheduled to lose accredited status

The following table presents the above information for each vulnerable jurisdiction.

Table 4.16: Kansas Region E Levee Failure Vulnerability Data

County	Jurisdiction	Name	People at Risk	Structures at Risk	Property Value	Levee Safety Action Risk Classification	Levee System Status on Effective FIRM
Barber	Medicine Lodge	LBA-0005	0	0	$0	Not Screened	-
Barber	-	LBA-0010	0	0	$0	Not Screened	-
Barton	-	Agricultural Levees 1	4	1	$230,000	Not Screened	Non-Accredited
Barton	-	Agricultural Levees 3	0	0	$0	Not Screened	Non-Accredited
Barton	-	Agricultural Levees 4	0	0	$0	Not Screened	Non-Accredited
Barton	Great Bend	Great Bend Levee Little Walnut	103	80	$33,400,000	Low	Accredited
Barton	Great Bend	Great Bend Levee North Side and Walnut NW	16,865	9,050	$2,280,000,000	Low	Accredited
Barton	Great Bend	Great Bend Levee South Side	344	173	$45,200,000	Low	Accredited
Barton	Albert	LBT-0001	0	0	$0	Not Screened	-
Pawnee	Larned	Larned Kansas Levee	1,121	855	$196,000	Low	Accredited

Source: USACE NLD

The following table indicates the total number of county structures and the associated percentage of the total number of county structures, and the total population and associated percentage of the total county population identified as at risk to levee failure.

Table 4.17: Kansas Region E Population Vulnerability Data for Levee Failure

County	Structures Identified as at Risk to Levee Failure	Percentage of Structures Identified at Risk	Population Identified as at Risk to Levee Failure	Percentage of Population Identified at Risk
Barber	0	0%	0	0%
Barton	9,304	73.3%	17,316	66.3%
Comanche	0	0%	0	0%
Edwards	0	0%	0	0%
Kiowa	0	0%	0	0%
Pawnee	855	27.0%	1,121	17.2%
Pratt	0	0%	0	0%
Stafford	0	0%	0	0%

Source: US Census Bureau and FEMA

The following detail specific **local concerns** as related to dam failure:

- In Barton County, the flood control levee for the City of Great Bend is located along the south and west boundaries of the city limits along the Arkansas River and Walnut Creek diversion channel. The majority of Great Bend (81.44%) is reported to be Zone X - protected by levee, as determined by FEMA DFIRMS GIS overlay of the city.
- In Pawnee County, the City of Larned is protected by a levee located on the southern boundary of the city on the Pawnee and Arkansas rivers. Areas north of the levee are identified as Zone C - area of minimal flood hazard.

4.8.7 – Impact and Consequence Analysis

As per EMAP standards, the information in the following table provides the Consequence Analysis.

Table 4.18: Dam and Levee Failure Consequence Analysis

Subject	Impacts of Dam and Levee Failure
Health and Safety of the Public	In areas of inundation, the impact to the public is expected to be severe. Impacts to the public in adjacent areas is expected to be minimal to moderate.
Health and Safety of Responders	Impact to responders is expected to be minimal with proper training. Impact could be severe if there is lack of training.
Continuity of Operations	Temporary relocation may be necessary if facilities or infrastructure is damaged.
Property, Facilities, and Infrastructure	In areas of inundation, impacts could be severe to facilities and infrastructure. .
Environment	In areas of inundation, impact to the environment are expected to be severe. Impact will lessen as distance increases.
Economic Conditions	In areas of inundation, impacts to the economy will depend on the scope of the inundation and the time it takes for the water to recede.
Public Confidence in the Jurisdiction's Governance	Perception of whether the failure could have been prevented, warning time, and response and recovery time will greatly impact the public's confidence.

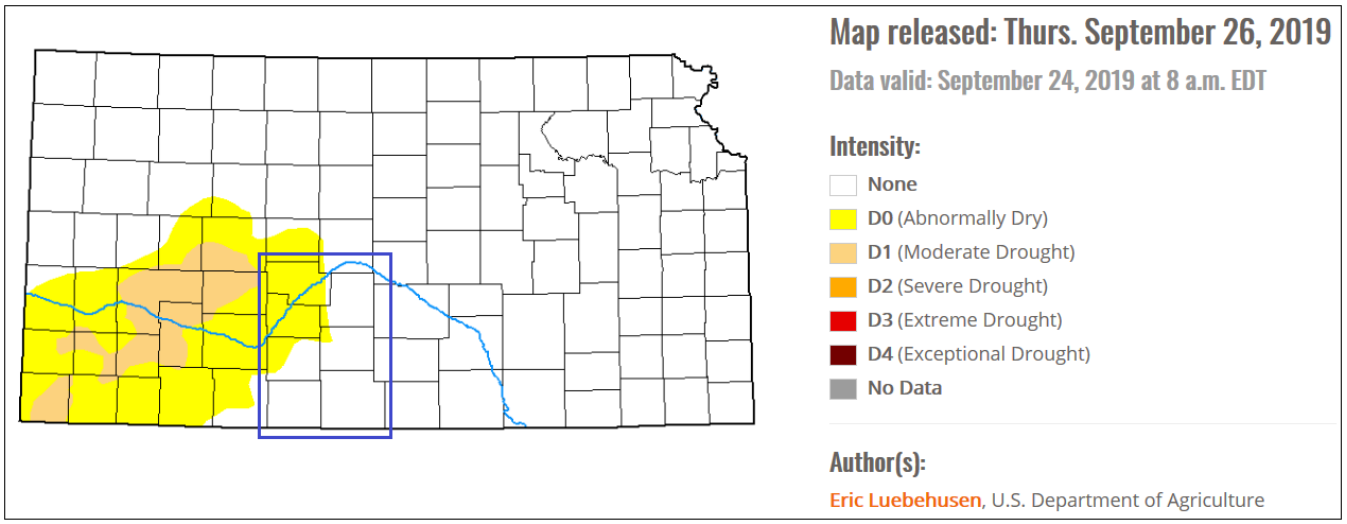
4.9 – Drought

Drought is an abnormally dry period lasting months or years when an area has a deficiency of water and precipitation in its surface and/or underground water supply. The hydrological imbalance can be grouped into the following non-exclusive categories.

- ***Agricultural:*** When the amount of moisture in the soil no longer meets the needs of previously grown crops.
- ***Hydrological:*** When surface and subsurface water levels are significantly below their normal levels.
- ***Meteorological:*** When there is a significant departure from the normal levels of precipitation.
- ***Socio-Economic:*** When the water deficiency begins to significantly affect the population.

4.9.1 – Location and Extent

While all of Kansas Region E is vulnerable to drought, it is most disastrous in the rural areas where the majority of agricultural businesses are located. The most commonly used drought index to determine the onset and the severity of a drought is the Palmer Drought Severity Index. The map below indicates the drought conditions for Kansas Region E.



4.9.2 – Previous Occurrences

One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor, which lists weekly drought conditions for the State of Kansas. The following table details the U.S. Drought Monitor categories.

Table 4.19: U.S. Drought Monitor Categories

Rating	Described Condition
None	No drought conditions
D0	Abnormally Dry
D1	Moderate Drought
D2	Severe Drought
D3	Extreme Drought
D4	Exceptional Drought

Source: U.S. Drought Monitor

Historical data was gathered from the U.S. Drought Monitor weekly reports from the 10-year period 2009 through 2018 (with 2009 and 2018 being full data set years). This data was compiled and aggregated to provide a yearly estimate of the percentage of the year Kansas Region E was in each Drought Monitor category.

Table 4.20: Percentage of Kansas Region E in U.S. Drought Monitor Category, 2009-2018

Year	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2019*	75.9%	24.1%	0.0%	0.0%	0.0%	0.0%
2018	36.0%	64.0%	49.0%	42.3%	27.7%	0.0%
2017	36.5%	63.5%	37.6%	4.0%	0.0%	0.0%
2016	74.1%	25.9%	11.9%	0.0%	0.0%	0.0%
2015	60.5%	39.5%	34.5%	0.0%	0.0%	0.0%
2014	0.0%	100.0%	99.0%	40.3%	11.0%	0.0%
2013	0.0%	101.9%	99.4%	72.2%	59.6%	0.0%
2012	5.8%	94.2%	81.5%	66.3%	45.8%	5.0%
2011	0.0%	100.0%	68.9%	62.1%	43.7%	7.7%
2010	77.7%	22.3%	0.7%	0.0%	0.0%	0.0%
2009	69.5%	30.5%	9.0%	0.0%	0.0%	0.0%

Source: U.S. Drought Monitor
*: Data through September 24, 2019

Another good indicator of historical droughts is USDA Disaster Declarations. The following table details USDA Drought Declarations during the five-year period 2014 through 2018 (with 2014 and 2018 being full data set years) for Kansas Region E.

Table 4.21: Kansas Region E Secretarial Drought Declarations, 2014-2018

Year	Number of Secretarial Drought Disaster Declarations
2018	6
2017	2
2016	0
2015	4
2014	7

Source: USDA

Crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of drought on the region's agricultural base. Crop loss data for the ten-

year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates 604 claims on 875,532 acres for $145,315,320.

Table 4.22: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Drought

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	169	320,809	$27,838,724
Barton	216	409,654	$44,676,028
Comanche	127	146,320	$11,773,283
Edwards	183	205,238	$18,467,270
Kiowa	149	150,167	$14,784,239
Pawnee	193	322,871	$33,831,863
Pratt	207	313,089	$25,562,465
Stafford	201	280,143	$27,850,202

Source: USDA

4.9.3 – Hazard Probability Analysis

Reviewing historical data from the U.S. Drought Monitor weekly reports from the ten-year period of 2009 through 2018 (with 2009 and 2018 being full data set years) a yearly average can be created indicating the percentage of the region in each Drought Monitor category. This average can be used to extrapolate the potential likelihood of future drought conditions.

Table 4.23: Kansas Region E Estimated Probability of Being in U.S. Drought Monitor Category

None	D0-D4	D1-D4	D2-D4	D3-D4	D4
43.6%	66.6%	49.2%	28.7%	18.8%	1.3%

Source: U.S. Drought Monitor

Additionally, over the five-year period 2014 to 2018 two years recorded a USDA Declared Secretarial Drought Disaster, equating to 40% chance of occurrence.

Data was reviewed from the USDA Risk Management agency to determine vulnerability to drought. The following table summarizes drought event data for **Barber County**

Table 4.24: Barber County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	169
Average Number of Claims per Year	17
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	320,809
Average Number of Acres Damaged per Year	32,081
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$27,838,724
Average Crop Damage per Year	$2,783,872

Source: USDA

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to drought occurrences:

- 17 insurance claims
- 32,081 acres impacted
- $2,783,872 in insurance claims

The following table summarizes drought event data for **Barton County**.

Table 4.25: Barton County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	216
Average Number of Claims per Year	22
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	409,654
Average Number of Acres Damaged per Year	40,965
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$44,676,028
Average Crop Damage per Year	$4,467,603

Source: USDA

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to drought occurrences:

- 22 insurance claims
- 40,965 acres impacted
- $4,467,603 in insurance claims

The following table summarizes drought event data for **Comanche County**.

Table 4.26: Comanche County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	127
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	146,320
Average Number of Acres Damaged per Year	14,632
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$11,773,283
Average Crop Damage per Year	$1,177,328

Source: USDA

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to drought occurrences:

- 13 insurance claims
- 14,632 acres impacted
- $1,177,328 in insurance claims

The following table summarizes drought event data for **Edwards County**.

Table 4.27: Edwards County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	183
Average Number of Claims per Year	18
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	205,238
Average Number of Acres Damaged per Year	20,524
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$18,467,270
Average Crop Damage per Year	$1,846,727

Source: USDA

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to drought occurrences:

- 18 insurance claims
- 20,524 acres impacted
- $1,846,727 in insurance claims

The following table summarizes drought event data for **Kiowa County**.

Table 4.28: Kiowa County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	149
Average Number of Claims per Year	15
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	150,167
Average Number of Acres Damaged per Year	15,017
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$14,784,239
Average Crop Damage per Year	$1,478,424

Source: USDA

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to drought occurrences:

- 15 insurance claims
- 15,017 acres impacted
- $1,478,424 in insurance claims

The following table summarizes drought event data for **Pawnee County**.

Table 4.29: Pawnee County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	193
Average Number of Claims per Year	19
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	322,871
Average Number of Acres Damaged per Year	32,287
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$33,831,863
Average Crop Damage per Year	$3,383,186

Source: USDA

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to drought occurrences:

- 19 insurance claims
- 32,287 acres impacted
- $3,383,186 in insurance claims

The following table summarizes drought event data for **Pratt County**.

Table 4.30: Pratt County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	207
Average Number of Claims per Year	21
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	313,089
Average Number of Acres Damaged per Year	31,309
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$25,562,465
Average Crop Damage per Year	$2,556,246

Source: USDA

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to drought occurrences:

- 21 insurance claims
- 31,309 acres impacted
- $2,556,246 in insurance claims

The following table summarizes drought event data for **Stafford County**.

Table 4.31: Stafford County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	201
Average Number of Claims per Year	20
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	280,143
Average Number of Acres Damaged per Year	28,014
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$27,850,202
Average Crop Damage per Year	$2,785,020

Source: USDA

According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to drought occurrences:

- 20 insurance claims
- 28,014 acres impacted
- $2,785,020 in insurance claims

4.9.4 Vulnerability Analysis

In general, structures and populations are not directly vulnerable to losses as a result of drought. However, there is a small potential that bridges could be impacted by shrinking soil as a result of drought conditions that could cause foundational or support damages.

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data (for the ten-year period from 2009 – 2018) allows us to quantify the monetary impact of drought conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to drought events.

Table 4.32: Drought Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	32,081	5.08%	$93,568,000	$2,783,872	2.98%
Barton	557,961	40,965	7.34%	$365,672,000	$4,467,603	1.22%
Comanche	453,556	14,632	3.23%	$51,803,000	$1,177,328	2.27%
Edwards	392,025	20,524	5.24%	$228,780,000	$1,846,727	0.81%
Kiowa	442,981	15,017	3.39%	$78,281,000	$1,478,424	1.89%
Pawnee	474,275	32,287	6.81%	$362,349,000	$3,383,186	0.93%
Pratt	465,191	31,309	6.73%	$271,307,000	$2,556,246	0.94%
Stafford	493,694	28,014	5.67%	$198,573,000	$2,785,020	1.40%

Source: USDA

Additional predictions about drought vulnerability can be made by reviewing data with the National Weather Service (NWS) Climate Prediction Center at www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php.

Drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. In addition, the water for cropland and livestock can be greatly impacted. The following are the potential water supply limitations that may result from drought conditions:

- **Basic Source Limitation** - The supplier's primary raw water source is particularly sensitive to drought as evidenced by depleted streamflow, depleted reservoir inflow and storage, or by declining water levels in wells. Restrictions imposed due to inability to use a well(s) because water quality problems were considered indicative of a basic source limitation.
- **Contractual Limitation** - The supplier's sole water source is purchased from another system that is drought vulnerable and there is a drought-cut-off clause in their water purchase contract. In such situations where there is not a drought cut-off clause, the purchaser is considered drought vulnerable under the same limitation category as the seller.

- **Distribution System Limitation** - The supplier has difficulty or is unable to meet drought-induced customer demand for water because of inadequate finished water storage capacity, inadequate finished water pumping capacity, inadequate transmission line sizes.
- **Minimum Desirable Streamflow** - The supplier reported imposing restrictions because of minimum desirable streamflow administration. Water rights junior to those granted for maintenance of established minimum desirable flows are subject to such administration.
- **Single Well Source** - The supplier relies upon a single well as its sole source for raw water. Suppliers with one active well and one emergency well were considered drought vulnerable because emergency wells are not a dependable long-term water source. Excessive hours of operation to meet drought-induced customer demand for water will result in the increased likelihood of mechanical breakdown with no alternative water supply source available.
- **Treatment Capacity Limitation** - The supplier has difficulty or is unable to meet drought-induced customer demand for water due to inadequate raw water treatment capacity.
- **Water Right Limitation** - The supplier reported imposing restrictions because the quantity of water they are authorized to divert under their water right(s) was insufficient to meet customer demands.

Water supply planning is the key to minimizing the effects of drought on the population and economy of the region. State of Kansas agencies have worked with public water suppliers to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought. Information concerning these plans, and any current water supply limitations, may be found with the Kansas Water Office.

4.9.5 – Impact and Consequence Analysis

As per EMAP standards, the following table provides the consequence analysis for drought conditions.

Table 4.33: Drought Consequence Analysis

Subject	Impacts of Drought
Health and Safety of the Public	Drought impact tends to be agricultural however, because of the lack of precipitation water supply disruptions can occur which can affect people. Impact is expected to be minimal.
Health and Safety of Responders	Impact to responders is expected to be minimal.
Continuity of Operations	Minimal expectation for utilization of the COOP.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the length and intensity of the drought. Structural integrity of buildings, and buckling of roads could occur.
Environment	The impact to the environment could be severe. Drought can severely affect farming, ranching, wildlife and plants due to the lack of precipitation.
Economic Conditions	Impacts to the economy will be dependent on how extreme the drought is and how long it lasts. Communities that depend on an agricultural economic engine will likely be severely stressed.
Public Confidence in the Jurisdiction's Governance	Confidence could be an issue during periods of extreme drought if planning is not in place to address intake needs and loss of crops.

4.10 – Earthquake

An earthquake is the result of a sudden release of energy in the Earth's crust that creates seismic waves that are typically caused by the rupturing of geological faults.

4.10.1 – Location and Extent

Kansas Region E is in a area of low potential seismic activity, with the Humboldt Fault (also known as the Nemaha Uplift) passing to the east of the region. Most earthquakes in the Humboldt Fault Zone are small and are detected only with instruments.

Humboldt Fault Zone

Two scales are used when referring to earthquake activity. Estimating the total force of an earthquake is the Richter scale, and the observed damage from an earthquake is the Modified Mercalli Intensity Scale. Additionally, both Acceleration (%g) and Velocity (cm/s) can be used to measure and quantify force and movement.

The following table equates the above referenced earthquake scales.

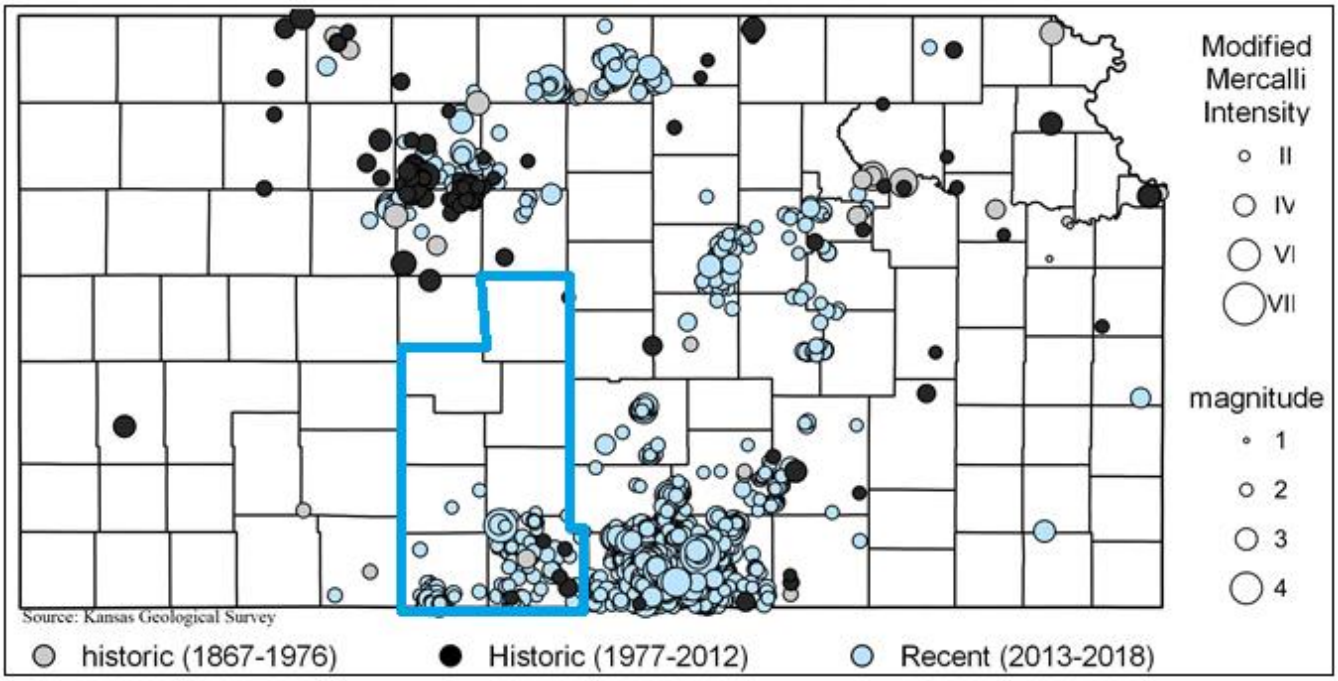
Table 4.34: Earthquake Magnitude Scale Comparison

Mercalli Scale Intensity	Verbal Description	Richter Scale Magnitude	Acceleration (%g)	Velocity (cm/s)	Witness Observations
I	Instrumental	1 to 2	0.17%	<0.1	None
II	Feeble	2 to 3	1.40%	1.1	Noticed only by sensitive people
III	Slight	3 to 4	1.40%	1.1	Resembles vibrations caused by heavy traffic
IV	Moderate	4	3.90%	3.4	Felt by people walking; rocking of free-standing objects
V	Rather Strong	4 to 5	9.20%	8.1	Sleepers awakened; bells ring
VI	Strong	5 to 6	18.00%	16	Trees sway, some damage from falling objects
VII	Very Strong	6	34.00%	31	General alarm, cracking of walls
VIII	Destructive	6 to 7	65.00%	60	Chimneys fall and some damage to building
IX	Ruinous	7	124.00%	116	Ground crack, houses begin to collapse, pipes break
X	Disastrous	7 to 8	>124.0%	>116	Ground badly cracked, many buildings destroyed. Some landslides
XI	Very Disastrous	8	>124.0%	>116	Few buildings remain standing, bridges destroyed.
XII	Catastrophic	8 or greater	>124.0%	>116	Total destruction; objects thrown in air, shaking and distortion of ground

4.10.2 – Previous Occurrences

The following map, from the KGS, shows all recorded earthquakes from 1867 through 2018.

KGS Historic Earthquake Map



The KGS Earthquake Catalog records earthquake events from 1979 through present. The following table details the Richter Scale Magnitude of any recorded events in the catalog.

Table 4.35: Region E Number of Earthquakes by Richter Scale Magnitude, 1979 - 2018

	0.1 -3.9	4.0 – 4.9	5.0 – 5.9	6.0 – 6.9	7.0- 7.9	8.0 +	Highest
Barber	157	1	0	0	0	0	4.2
Barton	0	0	0	0	0	0	-
Comanche	76	0	0	0	0	0	3.2
Edwards	0	0	0	0	0	0	-
Kiowa	2	0	0	0	0	0	2.1
Pawnee	0	0	0	0	0	0	-
Pratt	2	0	0	0	0	0	2.0
Stafford	0	0	0	0	0	0	-

Source: KGS

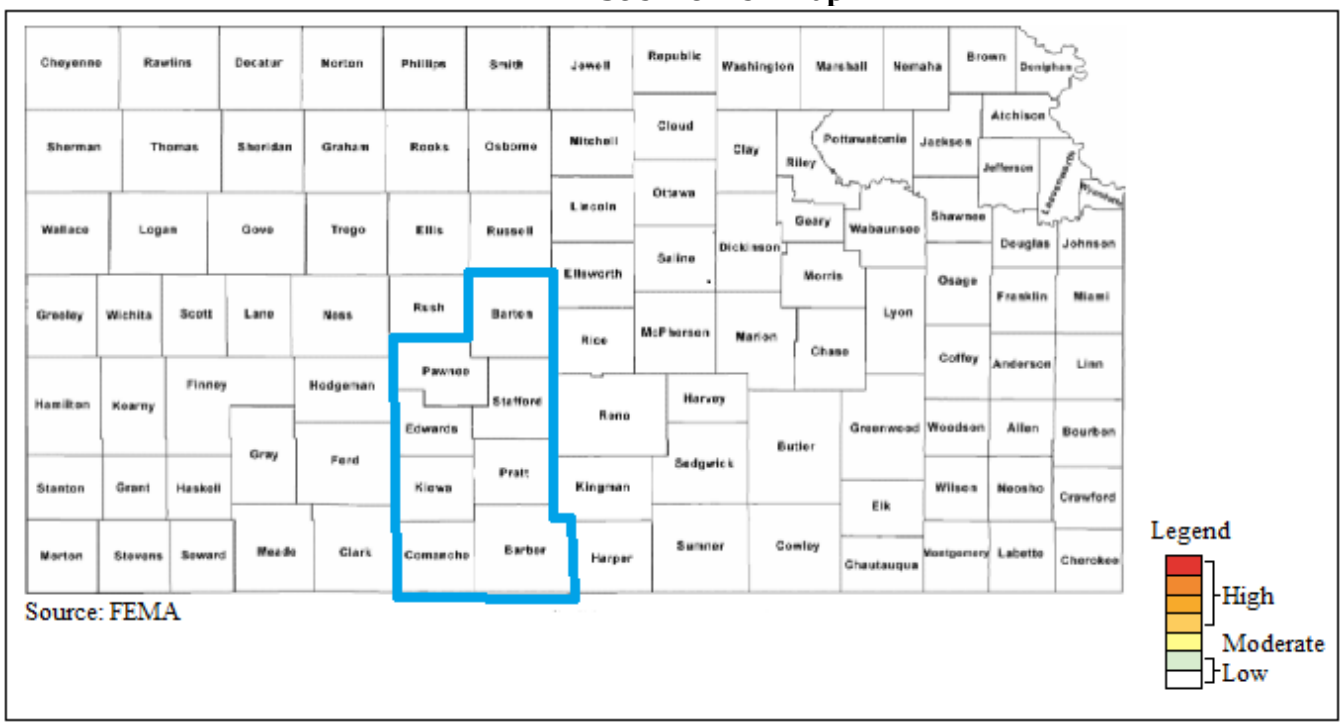
According to this archive, Kansas Region E has had one earthquake over magnitude 4.0 (recorded at a magnitude 4.2) earthquake since 1979.

Recently, concern about earthquakes caused by oil and gas exploration and production operations, has grown. Commonly, detected seismic activity associated with oil and gas operations, also known as induced seismicity, is thought to be triggered when wastewater is injected into disposal wells. According to the KGS, linking earthquakes to wastewater injection is difficult. Complex subsurface geology and limited data about that geology make it hard to pinpoint the cause seismic events. However, an established pattern of increased earthquake activity in an area over time may indicate a correlation between injection and seismic events.

4.10.3 – Hazard Probability Analysis

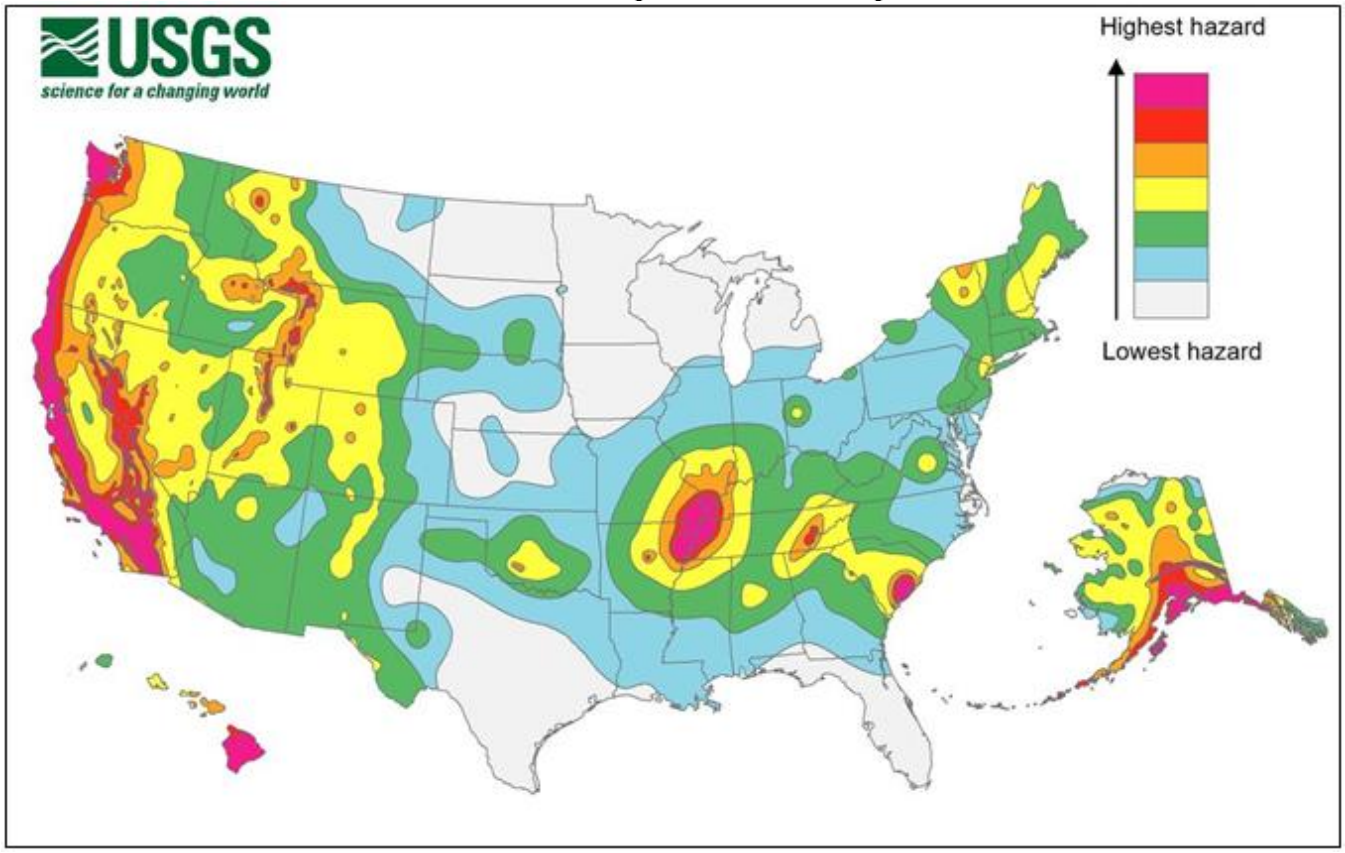
The following FEMA Seismic Risk Map for the United States indicates that all of the State of Kansas, including Kansas Region E, falls into the low hazard rankings.

FEMA Seismic Risk Map



The USGS also published a map that indicates hazard rankings based on acceleration (%g) for the United States, with the data correlating with the indicated FEMA risk. This map indicates the probability that ground shaking will exceed a certain level over a 50-year period. The low-hazard areas have a 2% chance of exceeding a designated low level of shaking and the high-hazard areas have a 2% chance of topping a much greater level.

USGS Earthquake Hazard Map



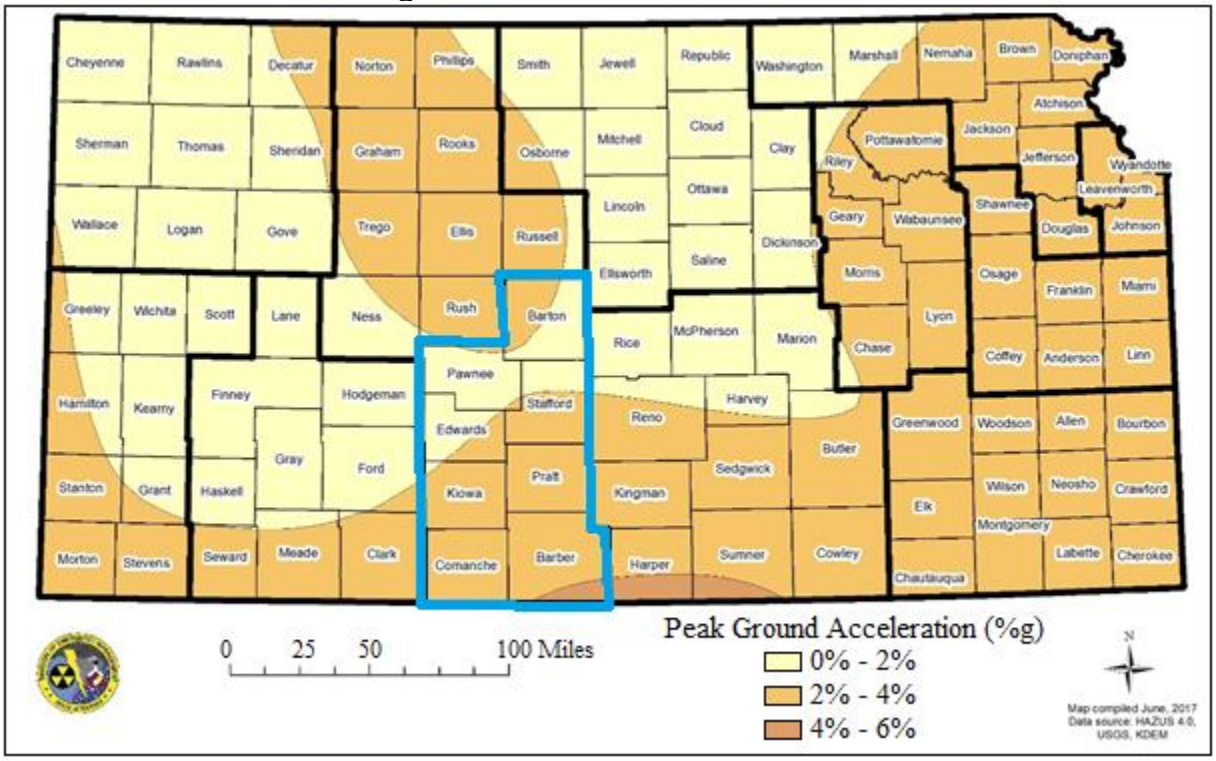
New research by Stanford University shows that oil and gas production injection limits enacted by the State Legislature has reduced he frequency of induced seismicity. Current modelling predicts that at current injection rates the number of widely felt earthquakes in Kansas will decrease to as few as 100 by 2020.

4.10.4 – Vulnerability Analysis

HAZUS, using the default inventory 2010 building valuations, was used to analyze vulnerability and estimate potential losses to earthquakes. A probabilistic, 2,500 Year 6.7 magnitude earthquake scenario was chosen to reveal areas of the region and state that are most vulnerable. These results are not meant to indicate annualized losses or damages as a result of a more typical low-magnitude event, but rather reveal vulnerabilities and losses for the worst-case scenario.

The following map, created using available HAZUS data, shows the ground shaking potential of a worst-case scenario 2,500-year 6.7 magnitude earthquake.

Regional Peak Ground Acceleration



Using available HAZUS data, the following potential losses from a worst-case scenario 2,500-year 6.7 Magnitude earthquake.

Table 4.36: Kansas Region E Probabilistic 6.7 Magnitude Earthquake Damages

County	Total Earthquake Losses	Displaced Households
Barber	$3,991,000	1
Barton	$11,293 ,000	3
Comanche	$1,249 ,000	<1
Edwards	$1,378 ,000	<1
Kiowa	$1,402 ,000	<1
Pratt	$2,455 ,000	1
Pawnee	$5,375 ,000	1
Stafford	$1,882 ,000	<1

Source: KDEM and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to earthquake events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.37: Kansas Region E Population Vulnerability Data for Earthquakes

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

Counties with a higher number of structures are to be considered to have a potentially greater vulnerability. The following table indicates the total number of housing units in each county (used as a representative figure for the total number of structures in each county, as housing numbers are closely tied to commercial structures) and the percentage change over the period 2000 to 2017.

Table 4.38: Kansas Region E Structure Vulnerability Data for Earthquakes

County	2017 Housing Units	Percent Change 2000 to 2017
Barber	2,792	1.9%
Barton	12,698	-1.5%
Comanche	987	-9.3%
Edwards	1,623	-7.5%
Kiowa	1,239	-24.6%
Pawnee	3,167	1.7%
Pratt	4,490	-3.1%
Stafford	2,338	-4.9%

Source: US Census Bureau

4.10.5 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis

Table 4.39: Earthquake Consequence Analysis

Subject	Impacts of Earthquake
Health and Safety of the Public	Severity and location dependent. Impacts on persons near the epicenter are expected to be severe.
Health and Safety of Responders	Severity and location dependent. Impacts on persons near the epicenter are expected to be severe.
Continuity of Operations	Severity and location dependent. Event will likely require relocation, essential function prioritization based on capabilities and severe disruption of services.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location of the facility and the severity of the

Table 4.39: Earthquake Consequence Analysis

Subject	Impacts of Earthquake
	event. Loss of structural integrity of buildings and infrastructure could occur.
Environment	The impact to the environment could be severe, including topological changes and severe destruction.
Economic Conditions	Impacts to the economy will be dependent severity of earthquake and proximity to the epicenter. Impacts will likely be long lasting and possibly permanent for most severely impacted businesses.
Public Confidence in the Jurisdiction's Governance	Confidence could be an issue if planning is not in place to address need of population, including mass sheltering and mass care.

4.11 – Expansive Soils

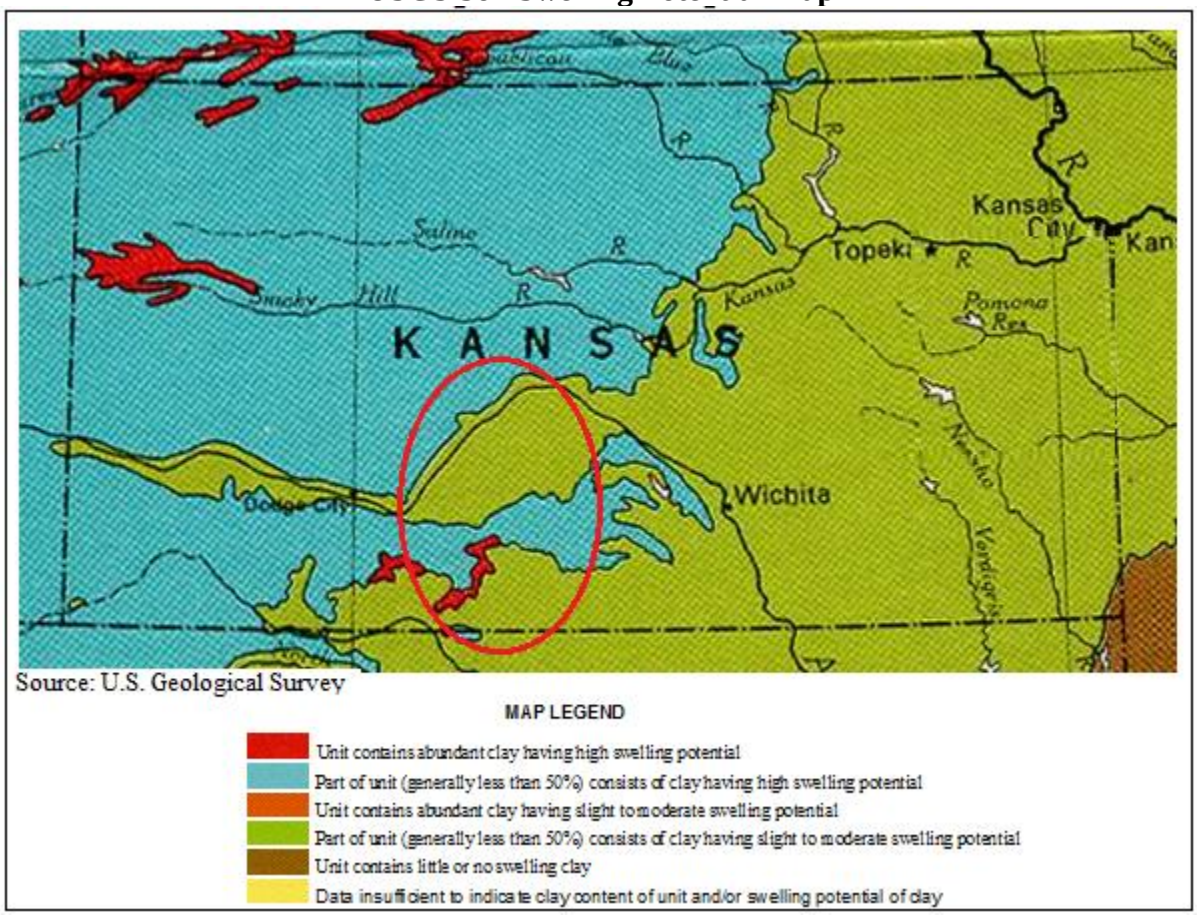
Expansive soils are slow to develop and do not usually pose a risk to public safety. The slow expansion and contraction of the clays and soils places pressure on structural foundations and subsurface dwellings. This pressure can become so great it damages foundations, cracks walls, and deforms structures.

4.11.1 – Location and Extent

Kansas Region E possesses a wide array of soils with a range of permeability from moderate to low. Generally, the permeability of the soils is related to the clay content. Clay soils tend to shrink when dry and swell when wet which has large implications on underground utility infrastructure and home foundations.

The map shows the swelling potential of soils in Kansas Region E.

USGS Soil Swelling Potential Map



Source: U.S. Geological Survey

4.11.2 – Previous Occurrences

No statewide database of expansive soils events is available.

Locally, there have been no reported expansive soil events within the past five years.

4.11.3 – Hazard Probability Analysis

Currently there is limited available data on this hazard, but it is held that each year in the United States, expansive soils cause billions of dollars in damage to buildings, roads, pipelines, and other structures. But, as expansive soils cause damage over extended periods of time damages caused may be attributed to other factors such as extended drought or heavy periods of moisture, both of which may exacerbate the hazard.

Because there is high clay content, high swell soils in the region, the probability of shrink/swell occurrence is 100%. However, the probability of damage is so poorly documented that is presently not possible to quantify the potential occurrence of a major damaging expansive soils event.

4.11.4 – Vulnerability Analysis

Physical structures are potentially vulnerable to highly expansive soil. It is estimated by KDEM that approximately 10% of the homes built on expansive soils could experience significant damage. Based on this, and using current available building valuations, the following table estimates the potential damages assuming a 50% impact on the value of the structure.

Table 4.40: Kansas Region E Estimated Potential Structural Damages, Expansive Soil

County	Property Valuation	Property Valuation for 10% of Building Stock	Estimated 50% Damage
Barber	$610,311,000	$61,031,100	$30,515,550
Barton	$3,331,357,000	$333,135,700	$166,567,850
Comanche	$222,342,000	$22,234,200	$11,117,100
Edwards	$408,386,000	$40,838,600	$20,419,300
Kiowa	$320,917,000	$32,091,700	$16,045,850
Pawnee	$794,977,000	$79,497,700	$39,748,850
Pratt	$1,209,374,000	$120,937,400	$60,468,700
Stafford	$515,938,000	$51,593,800	$25,796,900

Source: US Census Bureau

4.11.5 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.41: Expansive Soils Consequence Analysis

Subject	Impacts of Expansive Soils
Health and Safety of the Public	Minimal impact.
Health and Safety of Responders	Minimal impact.
Continuity of Operations	Minimal expectation for utilization of COOP unless structures have extensive damage.
Property, Facilities, and Infrastructure	Localized impact could be moderate, including structural integrity to be lost, and roadways, railways to buckle.
Environment	Expansive soils could cause moderate damage to dams, levees, watersheds.
Economic Conditions	Economic impacts include rebuilding of the properties and infrastructure. Drought and extreme rain events could increase impact.
Public Confidence in the Jurisdiction's Governance	Confidence will be dependent on development trends and mitigation efforts at reducing the effect of expansive soils on new construction.

4.12 – Extreme Temperatures

Extreme temperature events occur when climate conditions produce temperatures well outside of the predicted norm. These extremes can have severe impacts on human health and mortality, natural ecosystems, agriculture, and other economic sectors.

4.12.1 – Location and Extent

The Midwest climate region is known for extremes in temperature. Specifically, Kansas lacks any mountain ranges that could act as a barrier to cold air masses from the north or hot, humid air masses from the south or any oceans or large bodies of water that could provide a moderating effect on the climate. The polar jet stream is often located over the region during the winter, bringing frequent storms and precipitation. Kansas summers are generally warm and humid due to the clockwise air rotation caused by Atlantic high-pressure systems bringing warm humid air up from the Gulf of Mexico.

All of Kansas Region E is vulnerable to both extreme heat and extreme cold, defined as follows.

Table 4.42: Extreme Temperature Definitions

Term	Definition
Extreme Heat	Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when an area of high atmospheric pressure traps moisture laden air near the ground.
Extreme Cold	Although no specific definition exists for extreme cold, an extreme cold event can generally be defined as temperatures at or below freezing for an extended period of time. Extreme cold events are usually part of Winter Storm events but can occur during anytime of the year and can have devastating effects on agricultural production.

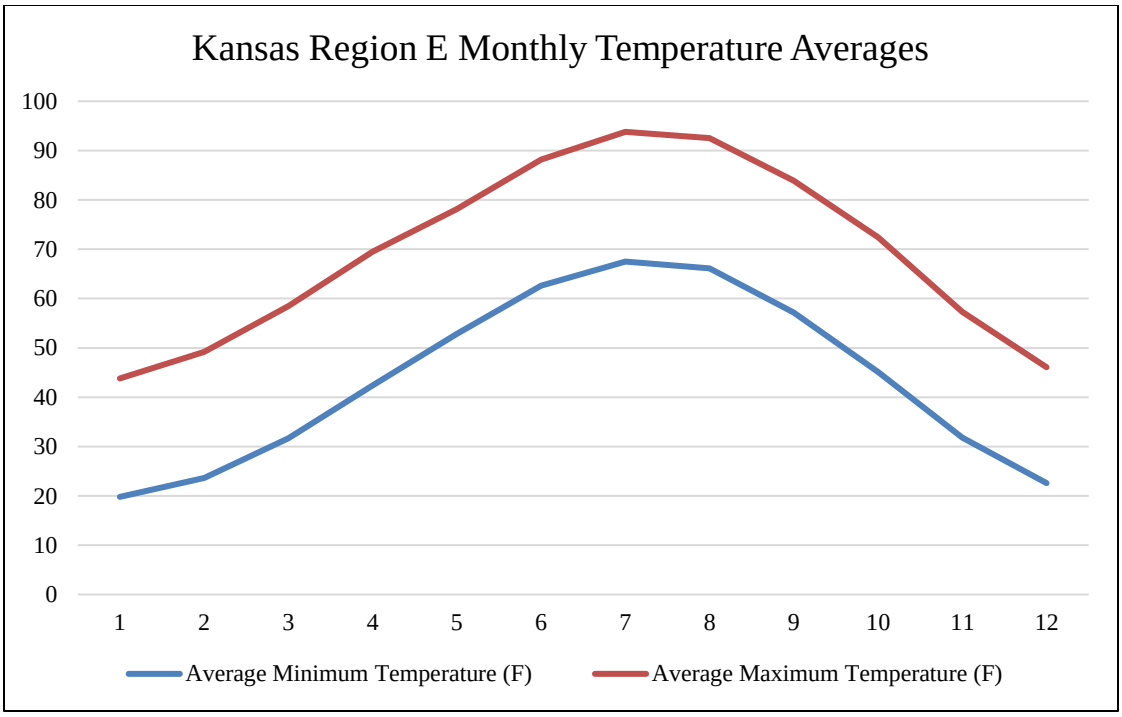
Data from the following High Plains Regional Climate Center weather stations from the first available date to present was obtained to illustrate regional temperature norms.

Table 4.43: Regional Average Temperatures

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Minimum Temperature (F)	19.8	23.6	31.7	42.4	52.8	62.6	67.5	66.1	57.2	45.1	31.8	22.6	43.6
Average Maximum Temperature (F)	43.8	49.2	58.5	69.5	78.1	88.2	93.8	92.5	83.9	72.4	57.3	46.1	69.4

Source: High Plains Regional Climate Center

The following graph illustrates the above data.



When discussing weather patterns climate change should be taken into account as it may markedly change future weather-related events. There is a scientific consensus that climate change is occurring, and recent climate modeling results indicate that extreme weather events may become more common. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events including longer and hotter heat waves (and by correlation, an increased risk of wildfires), higher wind speeds, greater rainfall intensity, and increased tornado activity.

4.12.2 – Previous Occurrences

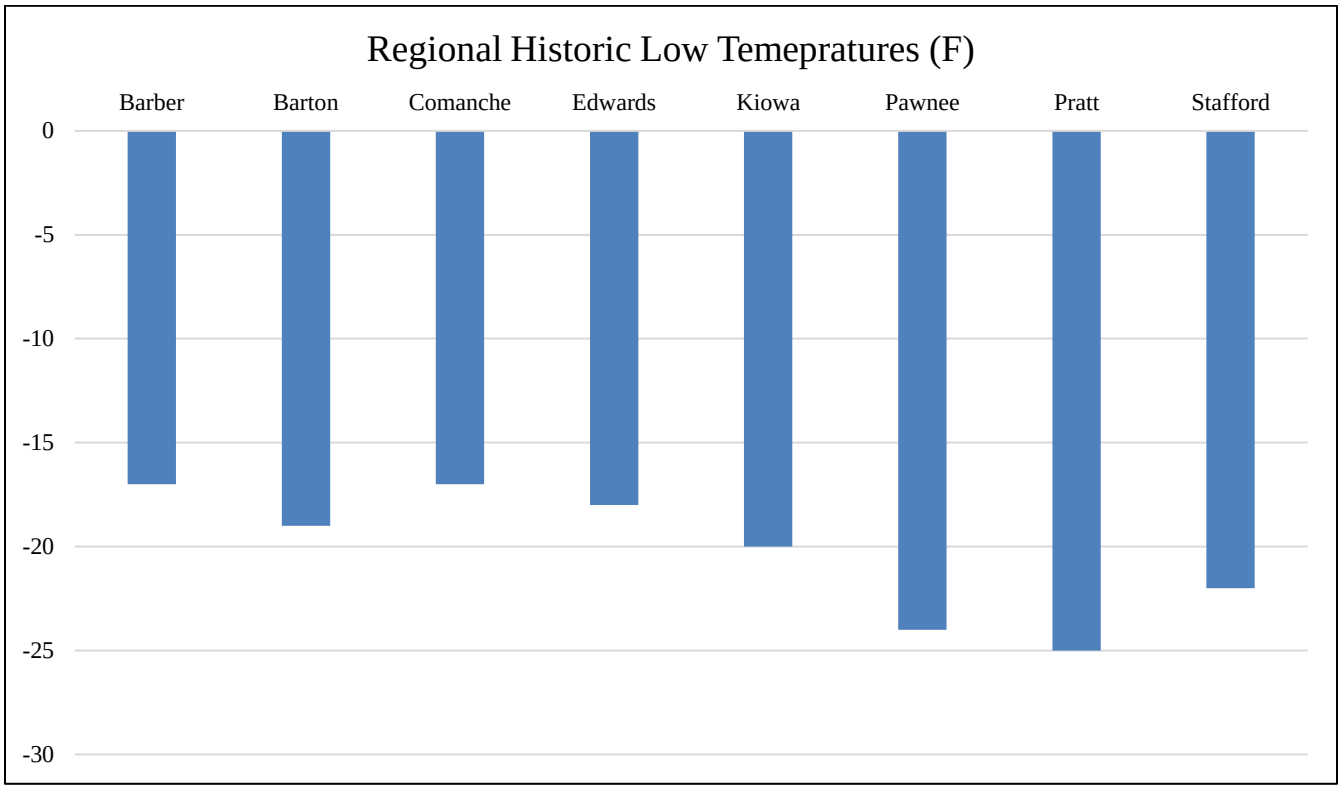
Data from the High Plains Regional Climate Center indicates the following historic high and low temperatures.

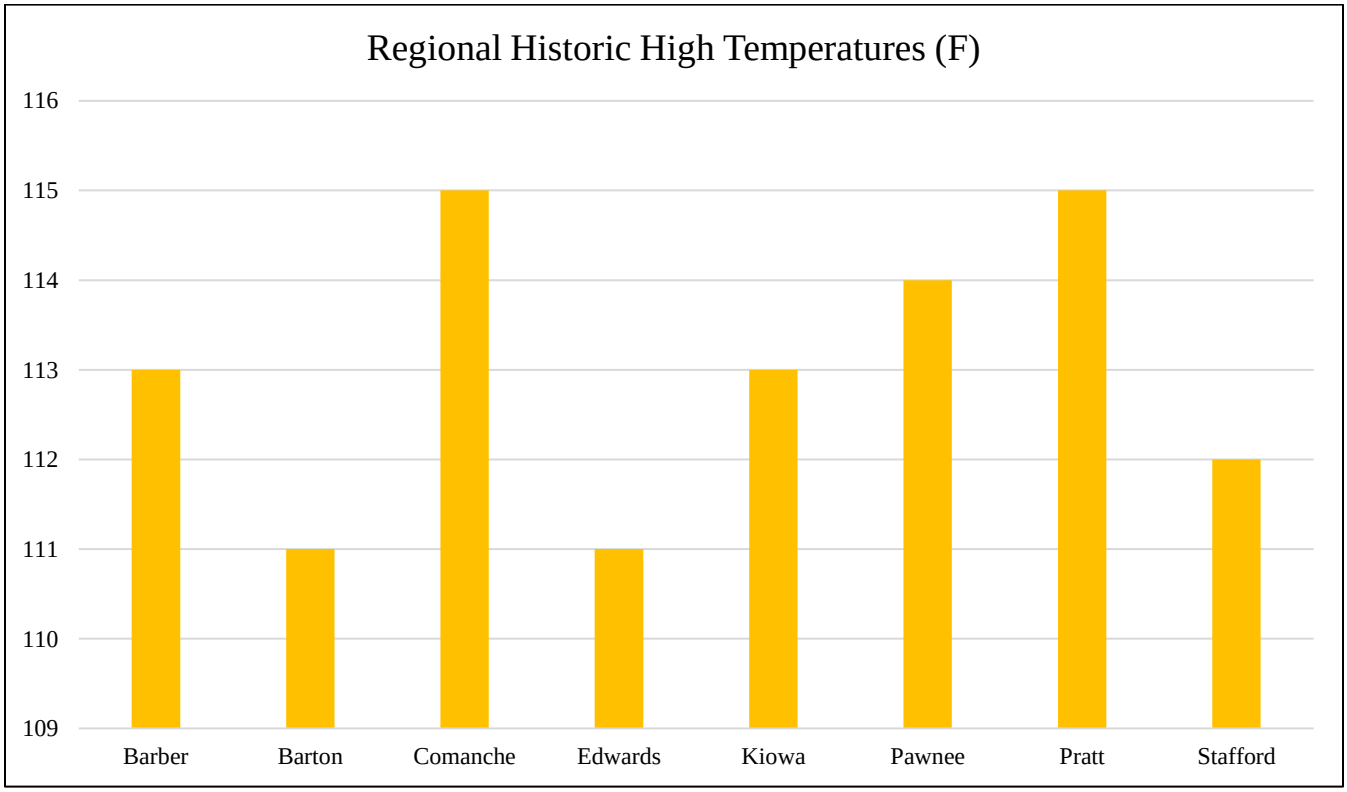
Table 4.44: Kansas Region E Historic Temperatures

County	Historic Low Temperature (F)	Historic High Temperature (F)
Barber	-17 (2011)	113 (2011)
Barton	-19 (1951)	111 (1980
Comanche	-17 (1974)	115 (1964)
Edwards	-18 (1989)	111 (2003)
Kiowa	-20 (1912)	113 (1936)
Pawnee	-24 (1905)	114 (1954)
Pratt	-25 (1899)	115 (1936)
Stafford	-22 (1905)	112 (1925)

Source: High Plains Regional Climate Center

The following graphs represent he above historic temperature data.


Regional Historic Low Temepratures (F)
Barber
Barton
Comanche
Edwards
Kiowa
Pawnee
Pratt
Stafford
0
-5
-10
-15
-20
-25
-30


Regional Historic High Temperatures (F)
116
115
114
113
112
111
110
109
Barber
Barton
Comanche
Edwards
Kiowa
Pawnee
Pratt
Stafford

The following table presents National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) identified extreme temperature events (Excessive Heat and Extreme Cold/Wind Chill) and the resulting damage totals in Kansas Region E from the period 2009-2018.

Table 4.45: Kansas Region E NCEI Extreme Temperature Events, 2009 - 2018

County	Event Type	Number of Events	Property Damage	Deaths	Injuries
Barber	Cold	1	$0	0	0
	Heat	0	$0	0	0
Barton	Cold	0	$0	0	0
	Heat	2	$0	0	0
Comanche	Cold	0	$0	0	0
	Heat	0	$0	0	0
Edwards	Cold	0	$0	0	0
	Heat	0	$0	0	0
Kiowa	Cold	0	$0	0	0
	Heat	0	$0	0	0
Pawnee	Cold	0	$0	0	0
	Heat	0	$0	0	0
Pratt	Cold	0	$0	0	0
	Heat	0	$0	0	0
Stafford	Cold	0	$0	0	0
	Heat	0	$0	0	0

Source: NOAA NCEI

Crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of extreme temperatures on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates 883 claims on 344,621 acres for $51,056,659.

Table 4.46: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Extreme Temperatures

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	54	8,227	$864,657
Barton	145	65,349	$9,929,478
Comanche	45	10,195	$1,590,624
Edwards	133	48,415	$6,433,605
Kiowa	99	26,515	$3,704,671
Pawnee	153	67,164	$12,246,301
Pratt	134	48,650	$5,915,695
Stafford	120	70,106	$10,371,628

Source: USDA Farm Service Agency

4.12.3 – Hazard Probability Analysis

Although periods of extreme heat and cold occur on an annual basis, events that create a serious public health risk or threaten infrastructure capacity occur less often. An extreme heat event is more likely to

occur in the months of June, July, August, and September, and an extreme cold event is more likely to occur in the months of November, December, January, February, and March. Also, the EPA has projected that with climate changes in the Great Plains, temperatures will continue to increase and impact all Kansas Region E communities.

As the reported extreme temperature events are regional, and not just county based, the following table summarizes extreme temperature event data for **Kansas Region E**.

Table 4.47: Kansas Region E Extreme Temperature Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	3
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Kansas Region E can expect on a yearly basis, relevant to extreme temperature events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to extreme temperatures. The following table summarizes extreme temperature event data for **Barber County**

Table 4.48: Barber County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	54
Average Number of Claims per Year	5
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	8,227
Average Number of Acres Damaged per Year	823
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$864,657
Average Crop Damage per Year	$86,466

Source: USDA

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- Five insurance claims
- 823 acres impacted
- $86,466 in insurance claims

The following table summarizes extreme temperatures event data for **Barton County**.

Table 4.49: Barton County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	145
Average Number of Claims per Year	15
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	65,349
Average Number of Acres Damaged per Year	6,535
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$9,929,478
Average Crop Damage per Year	$992,948

Source: USDA

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 15insurance claims
- 6,535 acres impacted
- $992,948 in insurance claims

The following table summarizes extreme temperatures event data for **Comanche County**.

Table 4.50: Comanche County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	45
Average Number of Claims per Year	5
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	10,195
Average Number of Acres Damaged per Year	1,020
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$1,590,624
Average Crop Damage per Year	$159,062

Source: USDA

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- Five insurance claims
- 1,020acres impacted
- $159,062 in insurance claims

The following table summarizes extreme temperatures event data for **Edwards County**.

Table 4.51: Edwards County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	133
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	48,415
Average Number of Acres Damaged per Year	4,841
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$6,433,605
Average Crop Damage per Year	$643,361

Source: USDA

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 13 insurance claims
- 4,481 acres impacted
- $643,361 in insurance claims

The following table summarizes extreme temperatures event data for **Kiowa County**.

Table 4.52: Kiowa County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	99
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	26,515
Average Number of Acres Damaged per Year	2,651
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,704,671
Average Crop Damage per Year	$370,467

Source: USDA

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- Ten insurance claims
- 2,651 acres impacted
- $370,467 in insurance claims

The following table summarizes extreme temperatures event data for **Pawnee County**.

Table 4.53: Pawnee County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	153
Average Number of Claims per Year	15
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	67,164
Average Number of Acres Damaged per Year	6,716
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$12,246,301
Average Crop Damage per Year	$1,224,630

Source: USDA

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 15 insurance claims
- 6,716 acres impacted
- $1,224,630 in insurance claims

The following table summarizes extreme temperatures event data for **Pratt County**.

Table 4.54: Pratt County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	134
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	48,650
Average Number of Acres Damaged per Year	4,865
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$5,915,695
Average Crop Damage per Year	$591,569

Source: USDA

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 13 insurance claims
- 4,865 acres impacted
- $591,569 in insurance claims

The following table summarizes extreme temperatures event data for **Stafford County**.

Table 4.55: Stafford County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	120
Average Number of Claims per Year	12
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	70,106
Average Number of Acres Damaged per Year	7,011
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$10,371,628
Average Crop Damage per Year	$1,037,163

Source: USDA

According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 12 insurance claims
- 7,011 acres impacted
- $1,037,163 in insurance claims

4.12.4 – Vulnerability Analysis

The primary concerns with this hazard are human health safety issues. Specific at-risk groups identified were outdoor workers, farmers, and senior citizens. Due to the potential for fatalities and the possibility for the loss of electric power due to increased strain on power generation and distribution for air conditioning, periods of extreme heat can affect the planning area.

Exposure to direct sun can increase Heat Index values by as much as 15°F. The zone above 105°F corresponds to a Heat Index that may cause increasingly severe heat disorders with continued exposure and/or physical activity. The following table discusses potential impacts on human health related to excessive heat.

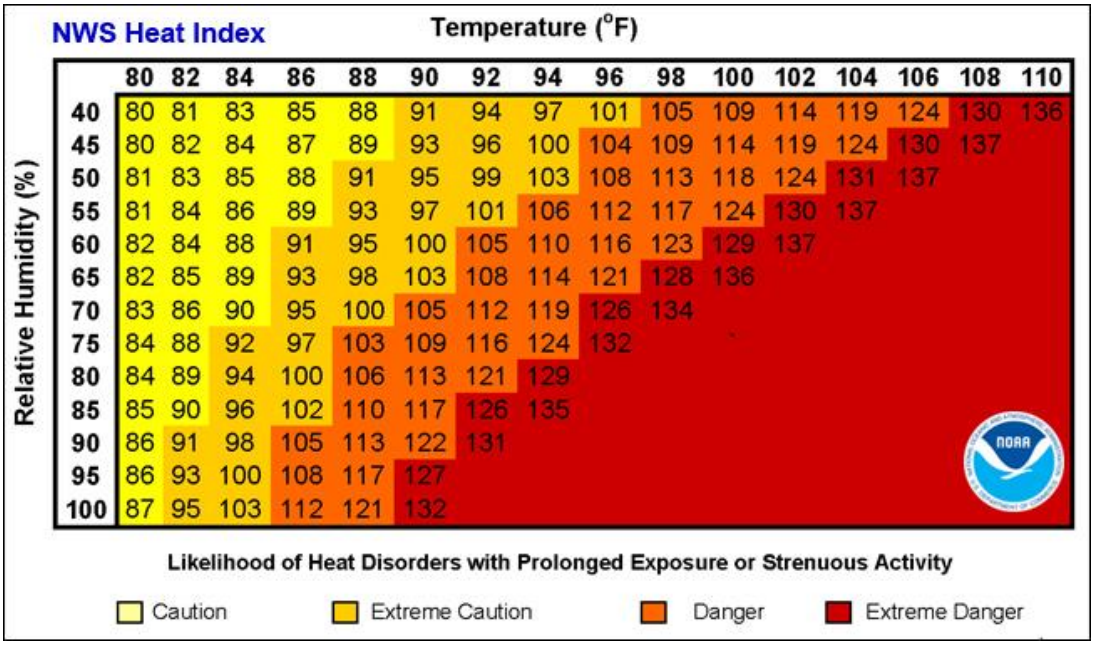
Table 4.56: Extreme Heat Impacts on Human Health

Heat Index (HI) Temperature	Potential Impact on Human Health
80-90° F	Fatigue possible with prolonged exposure and/or physical activity
90-105° F	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program

The following graph, from the NWS, indicates Heat Index values.

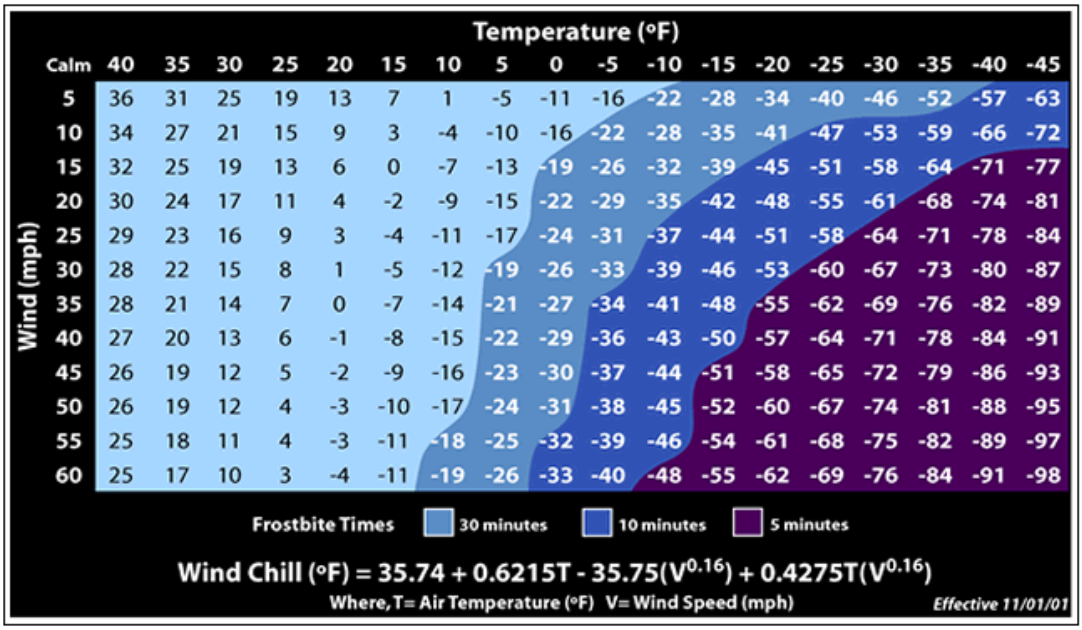
Heat Index



Extreme cold can cause hypothermia, an extreme lowering of the body's temperature, frostbite and death. Infants and the elderly are particularly at risk, but anyone can be affected. Other impacts of extreme cold include asphyxiation from toxic fumes from emergency heaters, household fires, which can be caused by fireplaces and emergency heaters, and frozen/burst water pipes. There are no specific data sources recording cold related deaths in east-central Kansas.

The following graph, from the NWS, shows wind chill values.

Wind Chill Values



Counties with a higher identified population are to be considered to have a potentially greater vulnerability to extreme temperature events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.57: Kansas Region E Population Vulnerability Data for Extreme Temperatures

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

Additionally, there is an increased likelihood of mortality for very young and very old populations due to extreme temperatures following table indicates the percentage of the total county population that may be considered especially vulnerable to extreme temperatures.

Table 4.58: Kansas Region E Vulnerable Population Vulnerability Data for Extreme Temperatures

County	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)
Barber	6.1%	23.0%
Barton	6.3%	19.2%
Comanche	4.9%	25.6%

Table 4.58: Kansas Region E Vulnerable Population Vulnerability Data for Extreme Temperatures

County	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)
Edwards	6.0%	21.3%
Kiowa	6.7%	21.9%
Pawnee	6.4%	22.2%
Pratt	7.0%	20.2%
Stafford	4.1%	21.0%

Source: US Census Bureau

In addition, extreme temperatures may exacerbate agricultural and economic losses. The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data for the five-year period 2009 - 2018 (data set includes full years for 2014 and 2018) allows us to quantify the monetary impact of extreme temperature conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to extreme temperature events.

Table 4.59: Extreme Temperature Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	823	0.13%	$93,568,000	$86,466	0.09%
Barton	557,961	6,535	1.17%	$365,672,000	$992,948	0.27%
Comanche	453,556	1,020	0.22%	$51,803,000	$159,062	0.31%
Edwards	392,025	4,841	1.23%	$228,780,000	$643,361	0.28%
Kiowa	442,981	2,651	0.60%	$78,281,000	$370,467	0.47%
Pawnee	474,275	6,716	1.42%	$362,349,000	$1,224,630	0.34%
Pratt	465,191	4,865	1.05%	$271,307,000	$591,569	0.22%
Stafford	493,694	7,011	1.42%	$198,573,000	$1,037,163	0.52%

Source: USDA

4.12.5 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.60: Extreme Temperature Consequence Analysis

Subject	Impacts of Extreme Temperatures
Health and Safety of the Public	Depending on the duration of the event, impact is expected to be severe for unprepared and unprotected persons. Impact will be minimal to moderate for prepared and protected persons.
Health and Safety of Responders	Impact could be severe if proper precautions are not taken, i.e. hydration in heat, clothing in extreme cold. With proper preparedness and protection, the impact would be minimal.
Continuity of Operations	Minimal expectation for utilization of the COOP.

Table 4.60: Extreme Temperature Consequence Analysis

Subject	Impacts of Extreme Temperatures
Property, Facilities, and Infrastructure	Impact to infrastructure could be minimal to severe depending on the temperature extremes.
Environment	The impact to the environment could be severe. Extreme heat and or cold could seriously damage wildlife and plants, trees and crops.
Economic Conditions	Impacts to the economy will be dependent on how extreme the temperatures get, but only in the sense of whether people will venture out to spend money. Utility bills could increase causing more financial hardship.
Public Confidence in the Jurisdiction's Governance	Confidence will be dependent on how well utilities hold up as they are stretched to provide heat and cool air, depending on the extreme. Planning and response could be challenged.

4.13 – Flood

Floods are most common in seasons of rain and thunderstorms. Floods that threaten Kansas Region E can be generally classified under two categories:

- **Flash Flood:** The product of heavy, localized precipitation in a short time period over a given location
- **Riverine Flood:** Occurs when precipitation over a given river basin for a long period of time causes the overflow of rivers, streams, lakes and drains

4.13.1 – Location and Extent

Flash Flooding

The NWS provides the following definitions of warnings for actual and potential flood conditions for Flash Floods:

- **Flash Flood Watch**: Issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain or imminent.
- **Flash Flood Warning**: Issued to inform the public, emergency management and other cooperating agencies that flash flooding is in progress, imminent, or highly likely.
- **Flash Flood Statement**: In hydrologic terms, a statement by the NWS which provides follow-up information on flash flood watches and warnings.

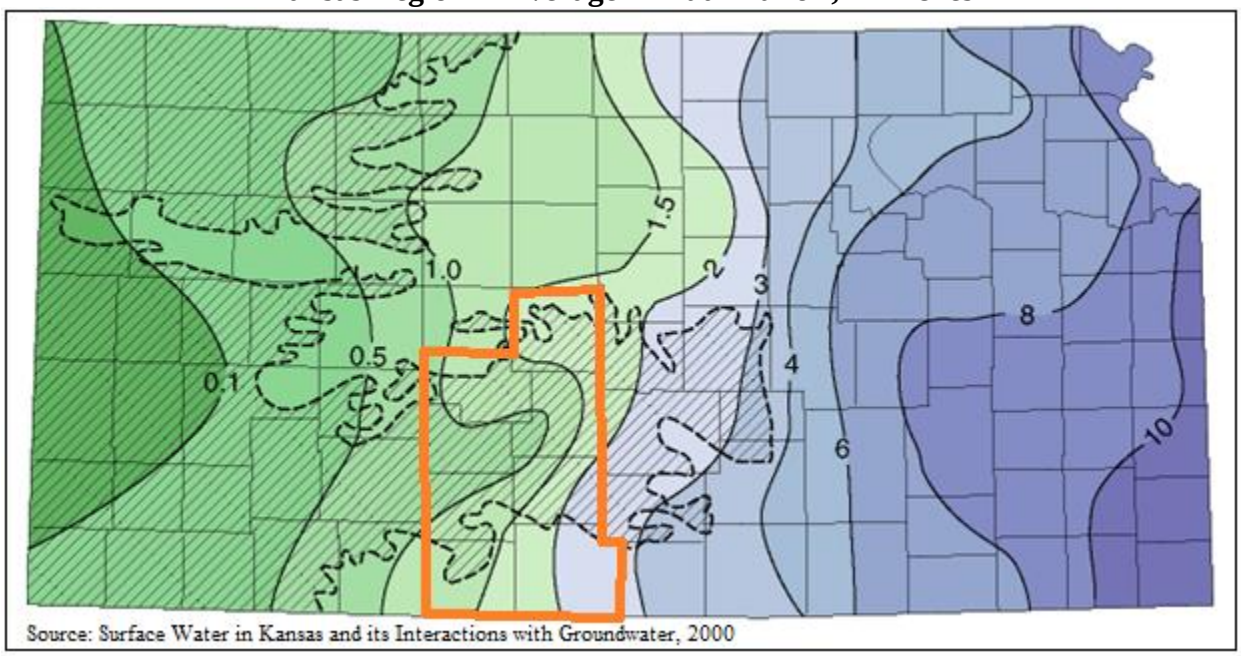
In general, flash flooding occurs in those locations in the planning area that are low-lying and/or do not have adequate drainage. Data from University of Kansas indicates that the average annual precipitation for Kansas Region E counties for 2013 - 2018 (the latest available data):

- Barber County: 29.7 inches
- Barton County: 20.3 inches
- Comanche County: 26.4 inches
- Edwards County: 24.1 inches
- Kiowa County: 27.6 inches
- Pawnee County: 27.9 inches
- Pratt County: 24.2 inches
- Stafford County: 30.6 inches

This equates to a regional average of 26.4 inches of precipitation for the six-year period 2013 - 2018.

The following map illustrates the distribution of water runoff in Kansas. Surface runoff is water from rain or snowmelt that flows on the surface and does not percolate into the subsurface. In general, the higher the surface runoff, the higher the potential for flash flooding.

Kansas Region E Average Annual Runoff, In Inches



Riverine Flooding

In general, riverine flooding occurs from the overflow of rivers, streams, drains, and lakes due to excessive rainfall. The NWS provides the following definitions of warnings for actual and potential flood conditions for riverine flooding:

- **Flood Potential Outlook:** In hydrologic terms, a NWS outlook that is issued to alert the public of potentially heavy rainfall that could send rivers and streams into flood or aggravate an existing flood.
- **Flood Watch:** Issued to inform the public and cooperating agencies that current and developing hydro meteorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.
- **Flood Warning:** In hydrologic terms, a release by the NWS to inform the public of flooding along larger streams in which there is a serious threat to life or property. A flood warning will usually contain river stage (level) forecasts.
- **Flood Statement:** In hydrologic terms, a statement issued by the NWS to inform the public of flooding along major streams in which there is not a serious threat to life or property. It may also follow a flood warning to give later information.

All areas of Kansas Region E located near a stream or river are at risk of riverine flooding. While riverine floods can and do occur at various levels, the one percent annual chance flood has been chosen as the basis for this risk assessment. This level is the accepted standard for flood insurance and regulatory purposes.

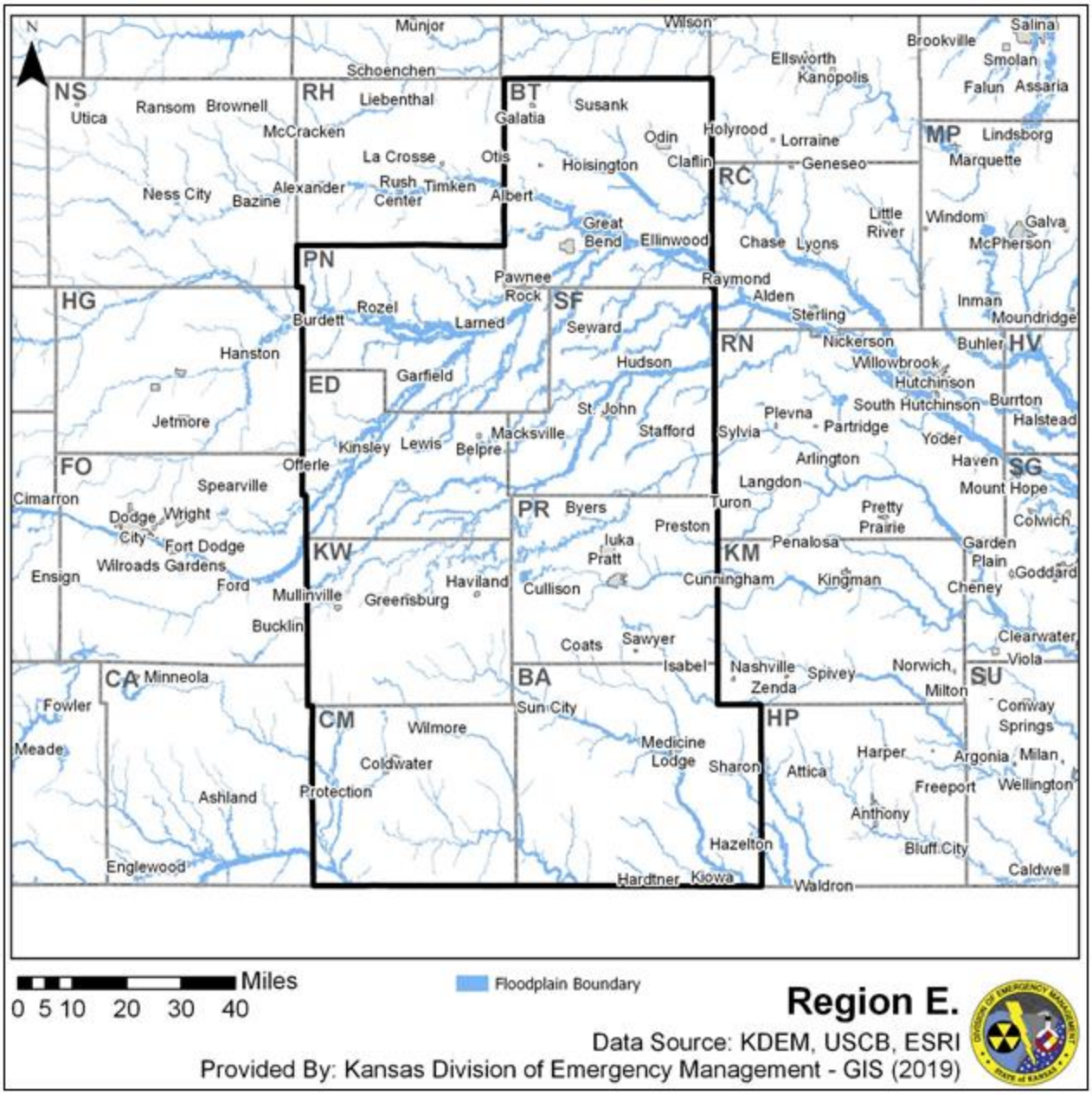
Flood probability can be expressed by recurrence interval, the average period of time for a flood that equals or exceeds a given magnitude, expressed as a period of years. The probability of occurrence of a given flood can also be expressed as the odds of recurrence of one or more similar or bigger floods in a certain number of years. Large, catastrophic floods have a very low frequency or probability of occurrence, whereas smaller floods occur more often. The larger the number of years in a recurrence interval, the smaller the chances of experiencing that flood in a year. However, the odds are never zero, even very large, uncommon floods always have a very small chance of recurring every year. When reviewing flood probability, it is important to note that once a flood occurs its chance of recurring the next year remains the same.

Table 4.61: Flood Recurrence Interval Probability

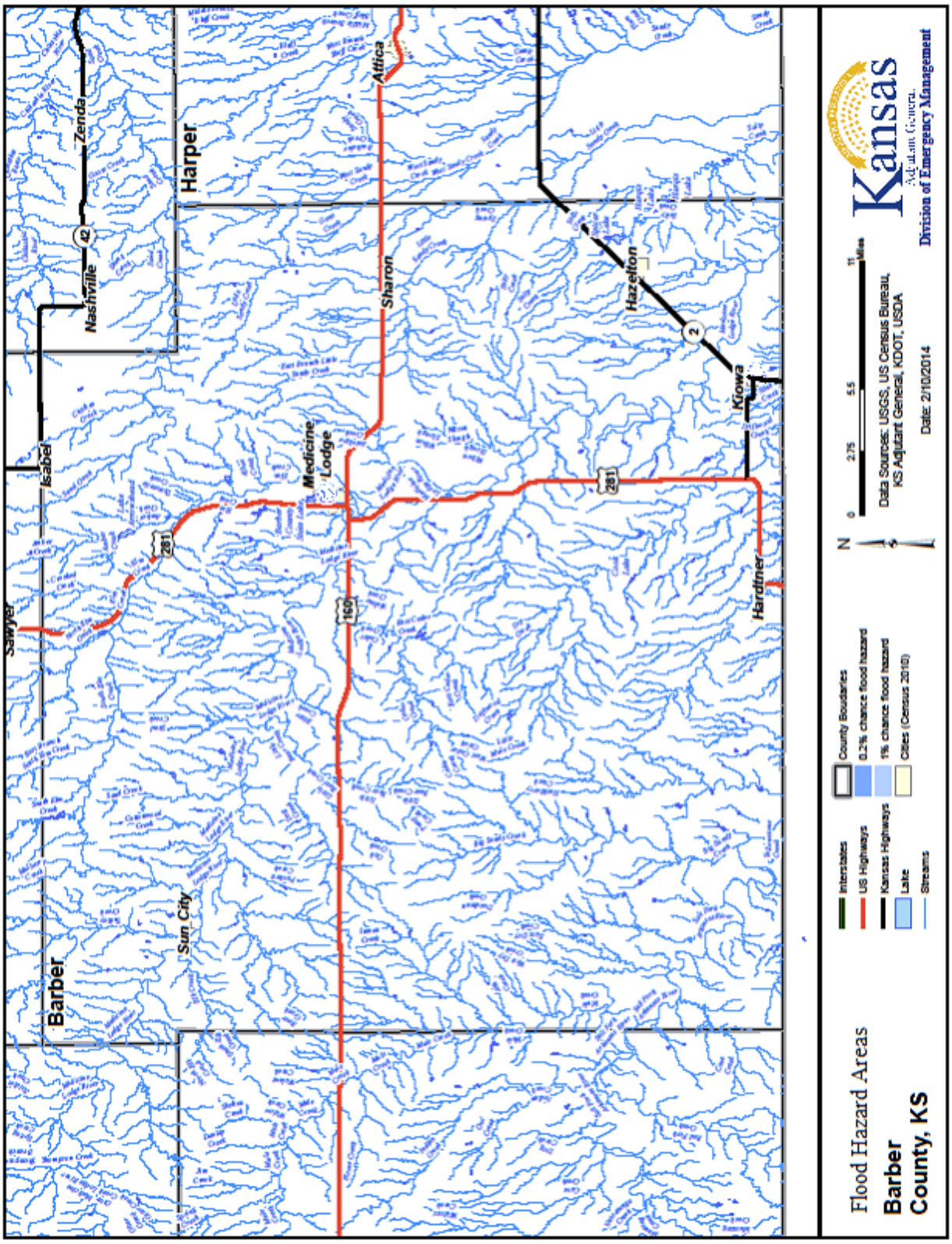
Recurrence Interval, in Years	Probability of Occurrence in Any Given Year	Percent Chance of Occurrence in Any Given Year
100	1 in 100	1
50	1 in 50	2
25	1 in 25	4
10	1 in 10	10
5	1 in 5	20
2	1 in 2	50

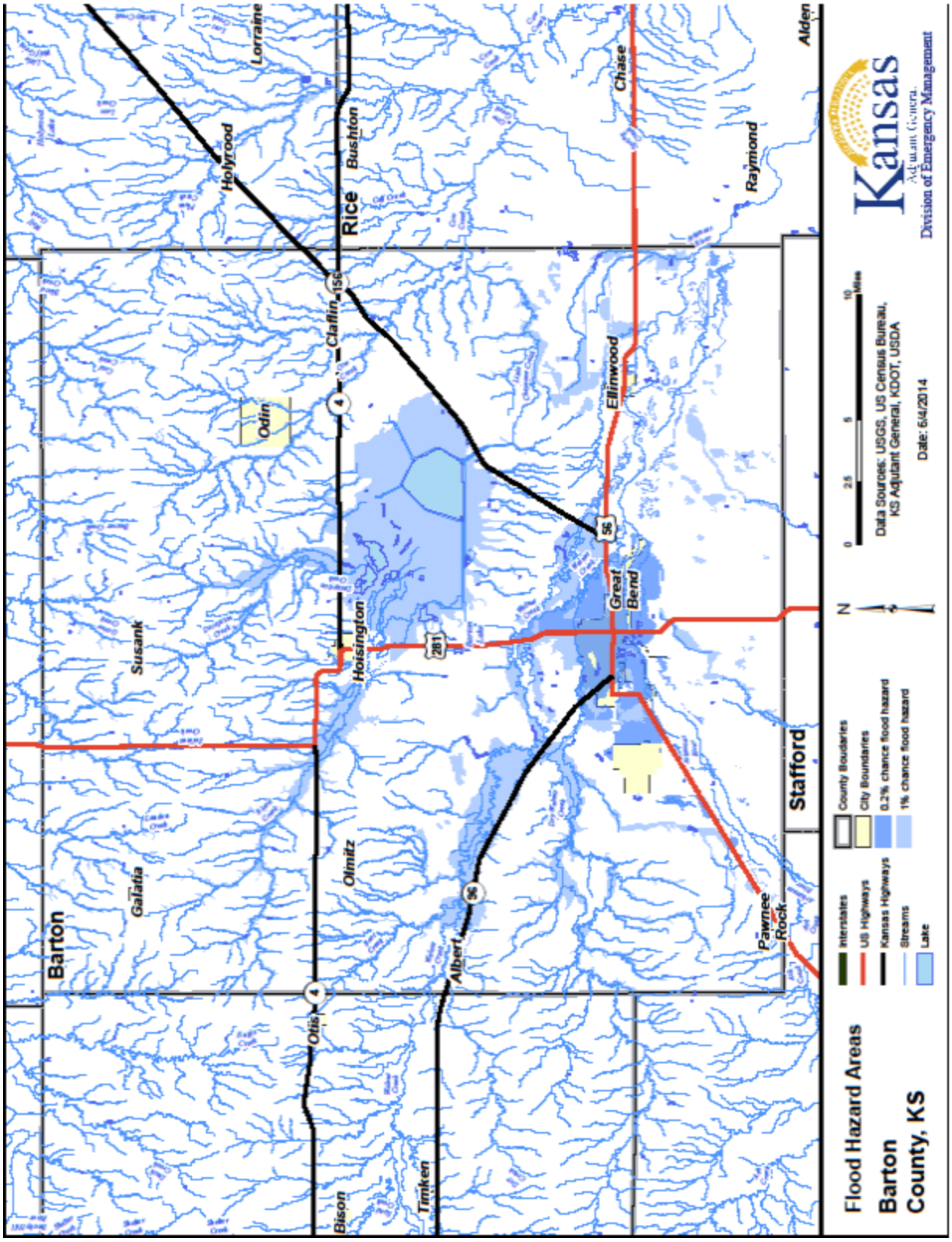
Source: FEMA

The following map, generated by KDEM using available data, depicts regional one percent annual flood areas.



Please note that at the time of this plan only two counties, Barton and Edwards, were fully mapped. If available, other relevant maps indicating potential flooding zones have been included.


Flood Hazard Areas
Barber
County, KS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boundaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0
2.75
5.5
11
Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
Kansas
Division of Emergency Management
Barber
Sun City
Sawyer
Isabel
Medicine Lodge
Harper
Nashville
Zenda
Attica
Sharon
Hazelton
Kiowa
Hardtner
281
160
42
2


Flood Hazard Areas
Barton
County, KS
Kansas
Adjutant General's
Division of Emergency Management
Data Sources: USGS, US Census Bureau,
KS Adjutant General, KDOT, USDA
Date: 6/4/2014
0
2.5
5
10
Miles
N
County Boundaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
Barton
Rice
Stafford
Lorraine
Holyrood
Bushton
Chase
Alden
Raymond
Claflin
Ellinwood
Odin
Susank
Hoisington
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Olmitz
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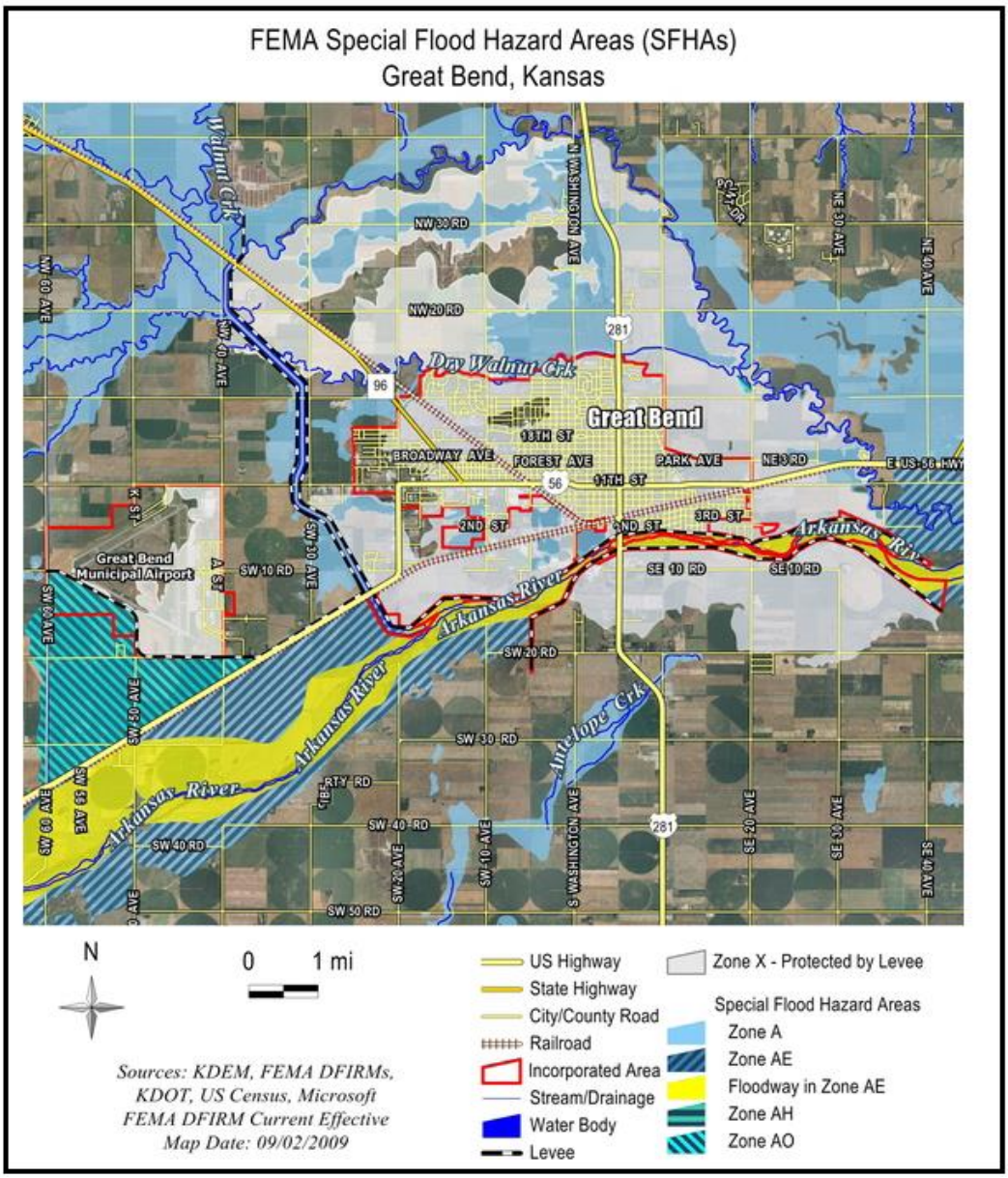
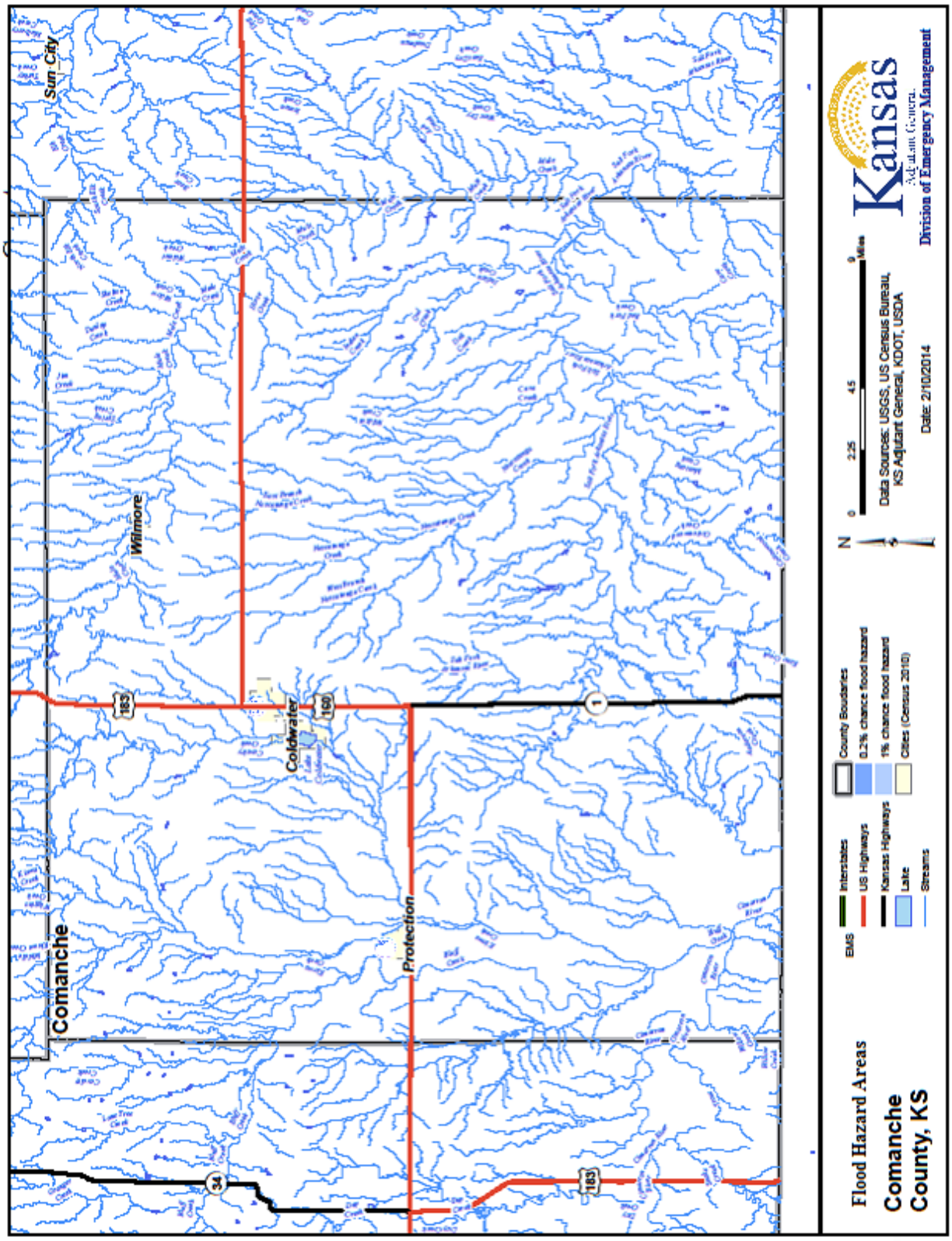
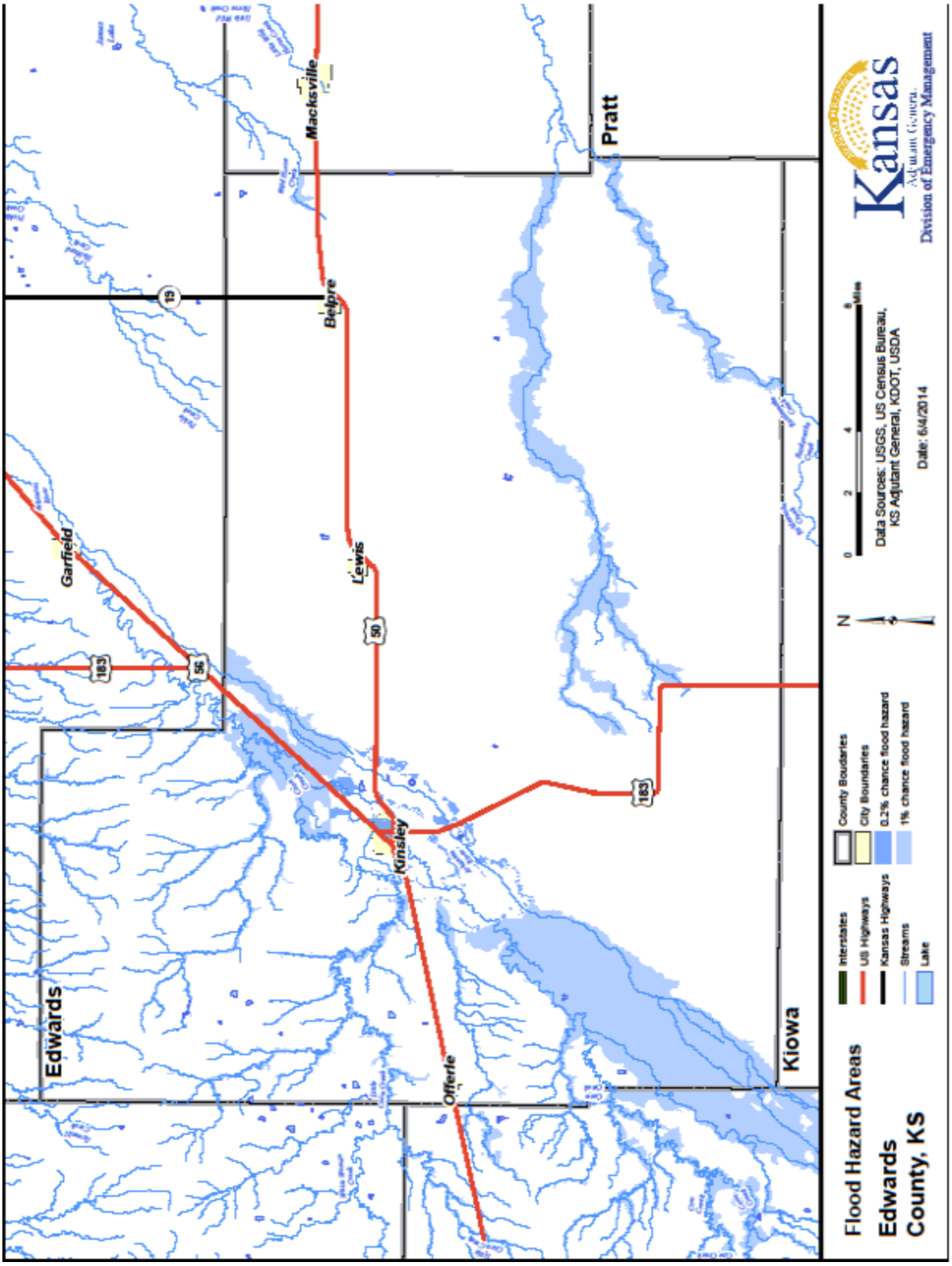
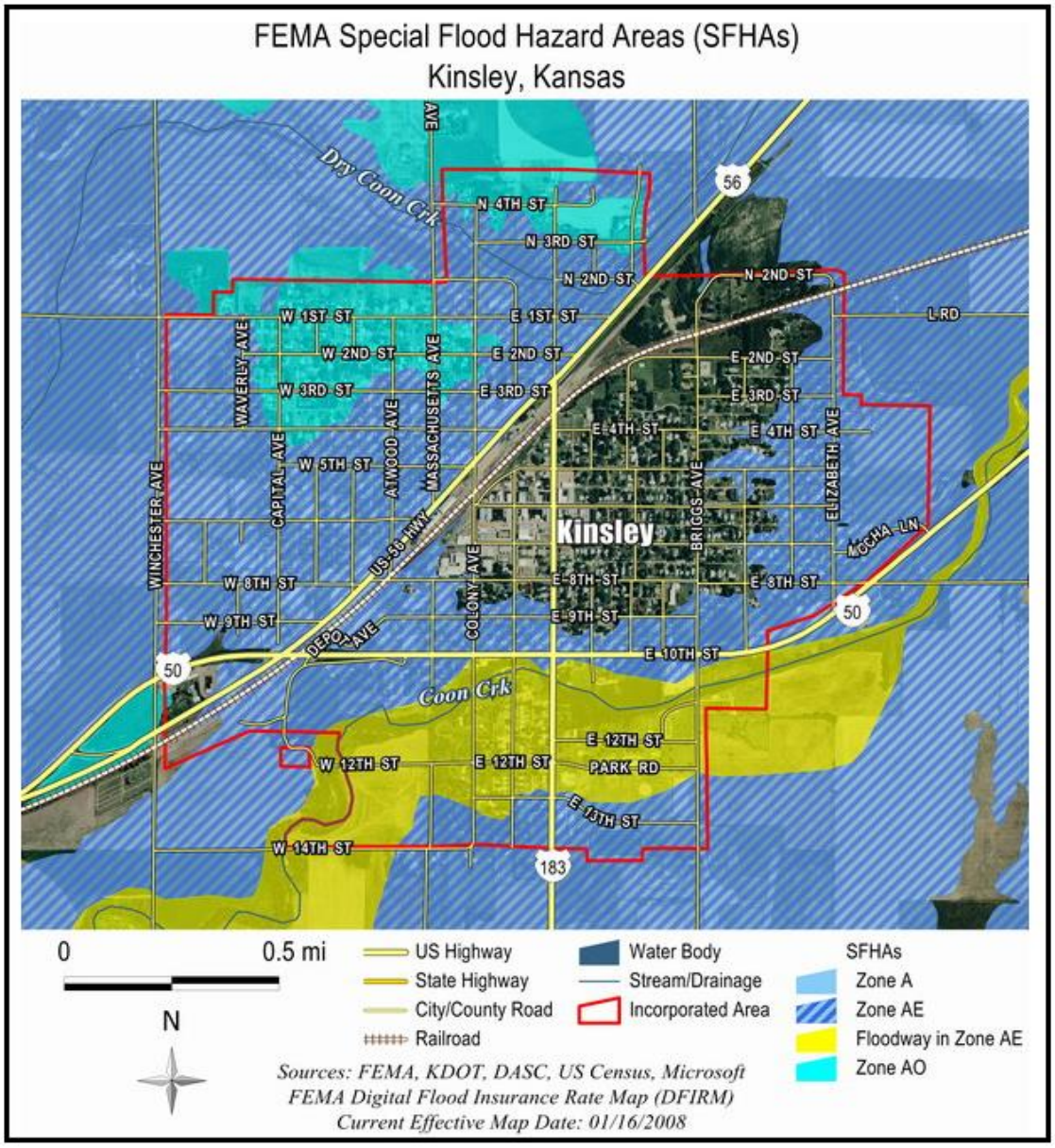
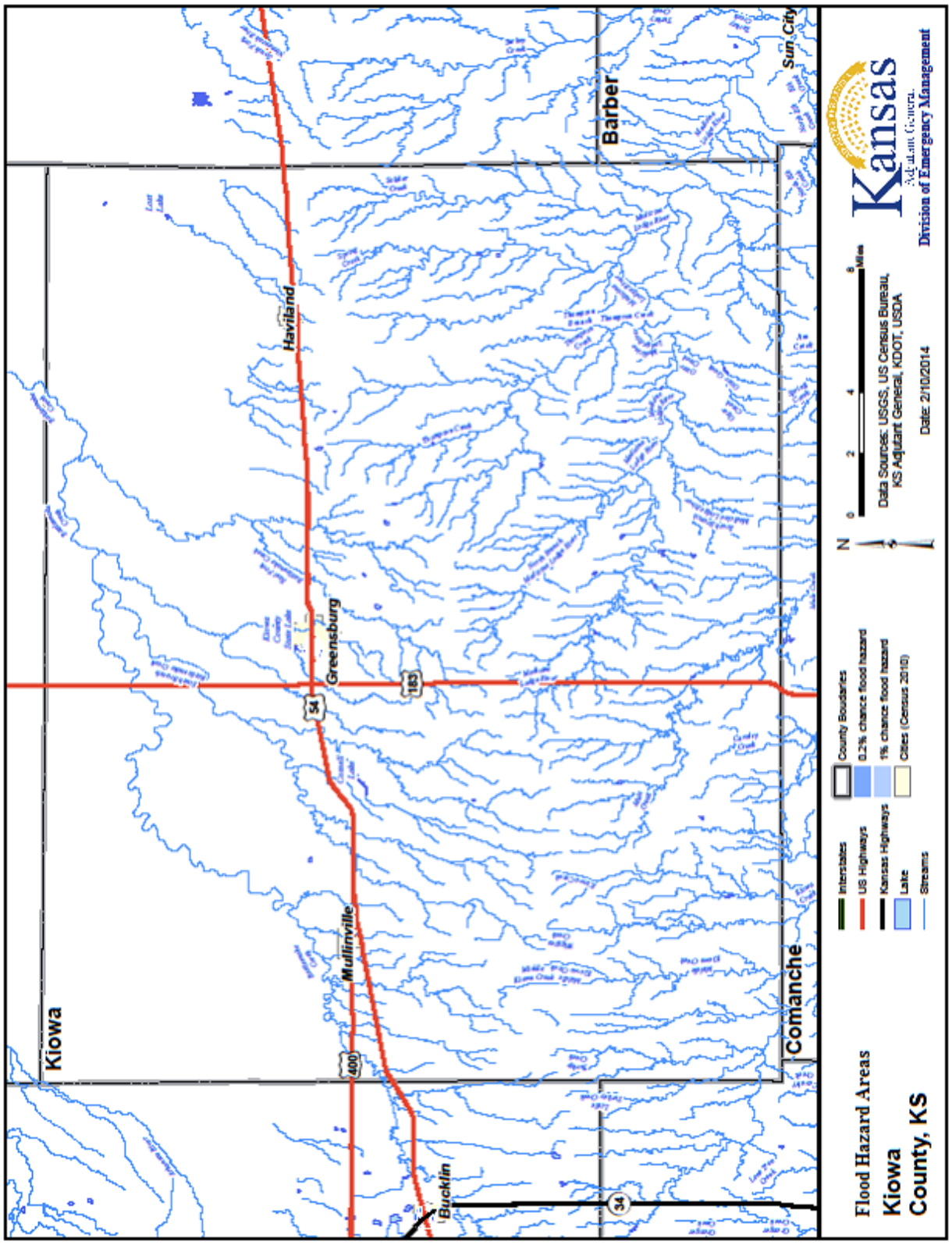
96

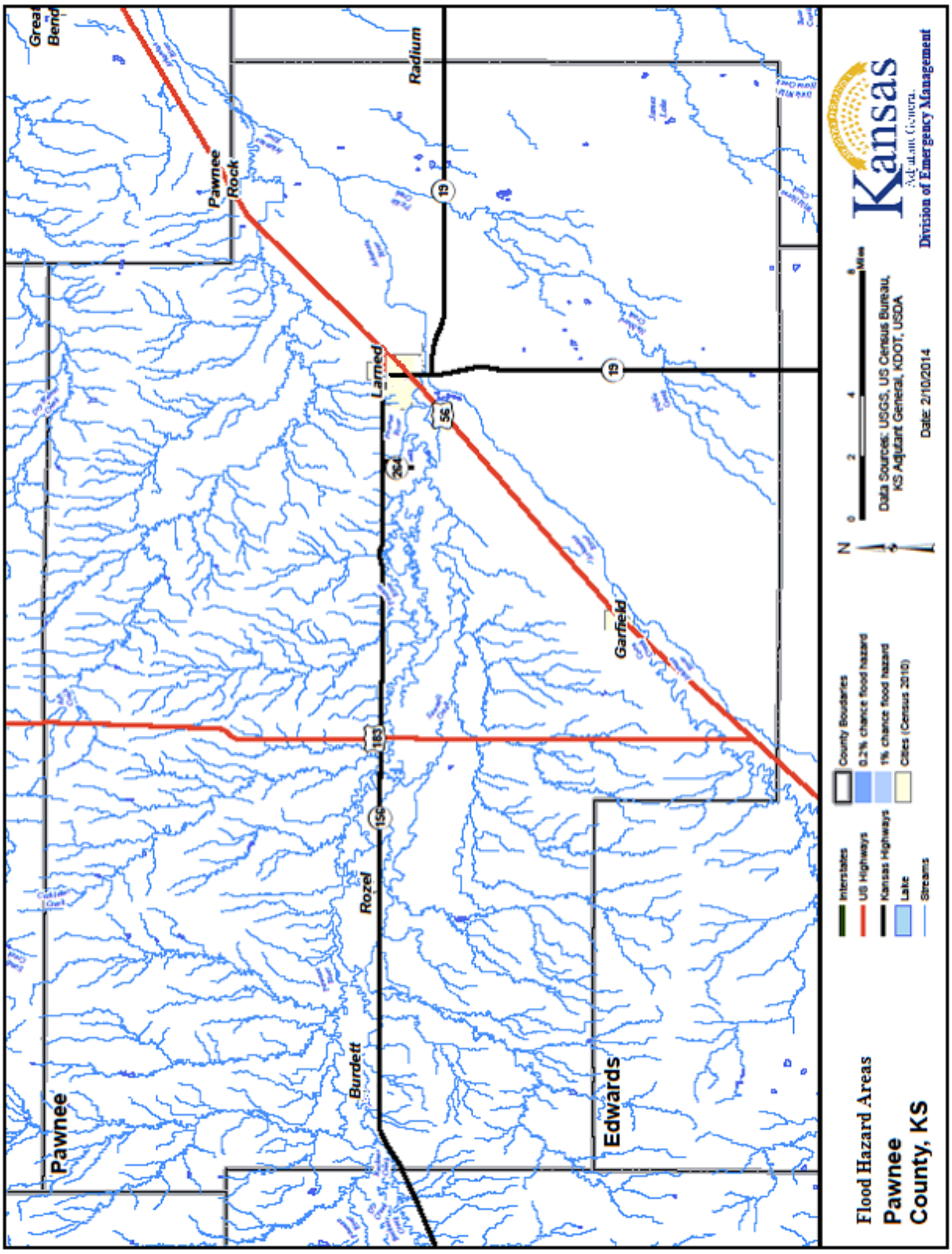

FEMA Special Flood Hazard Areas (SFHAs)
Great Bend, Kansas
Great Bend
Great Bend Municipal Airport
Walnut Crk
Dry Walnut Crk
Arkansas River
Antelope Crk
N
0
1 mi
Sources: KDEM, FEMA DFIRMs, KDOT, US Census, Microsoft
FEMA DFIRM Current Effective Map Date: 09/02/2009
US Highway
State Highway
City/County Road
Railroad
Incorporated Area
Stream/Drainage
Water Body
Levee
Zone X - Protected by Levee
Special Flood Hazard Areas
Zone A
Zone AE
Floodway in Zone AE
Zone AH
Zone AO


Flood Hazard Areas
Comanche County, KS
EMS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boundaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0
2.25
4.5
9 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
Kansas
Adjutant General's
Division of Emergency Management
Sun City
Wilmore
Coldwater
Protection
Comanche
183
160
1
34

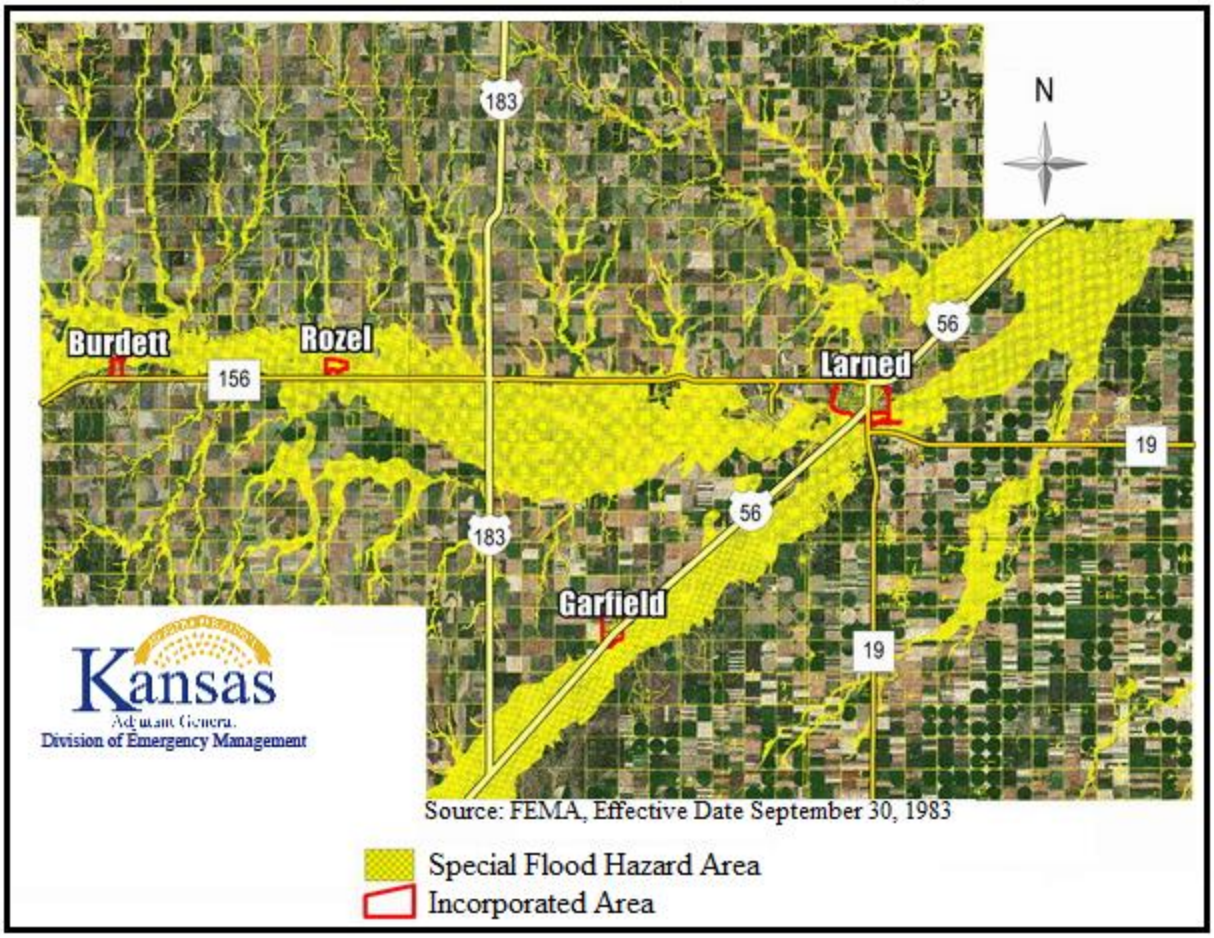

Flood Hazard Areas
Edwards
County, KS
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boundaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard
N
0
2
4
8 Miles
Data Sources: USGS, US Census Bureau,
KS Adjutant General, KDOT, USDA
Date: 6/4/2014
Kansas
Adjutant General
Division of Emergency Management
Macksville
Pratt
Belpre
Garfield
Lewis
Kinsley
Offerle
Edwards
Kiowa
19
56
183
50
183

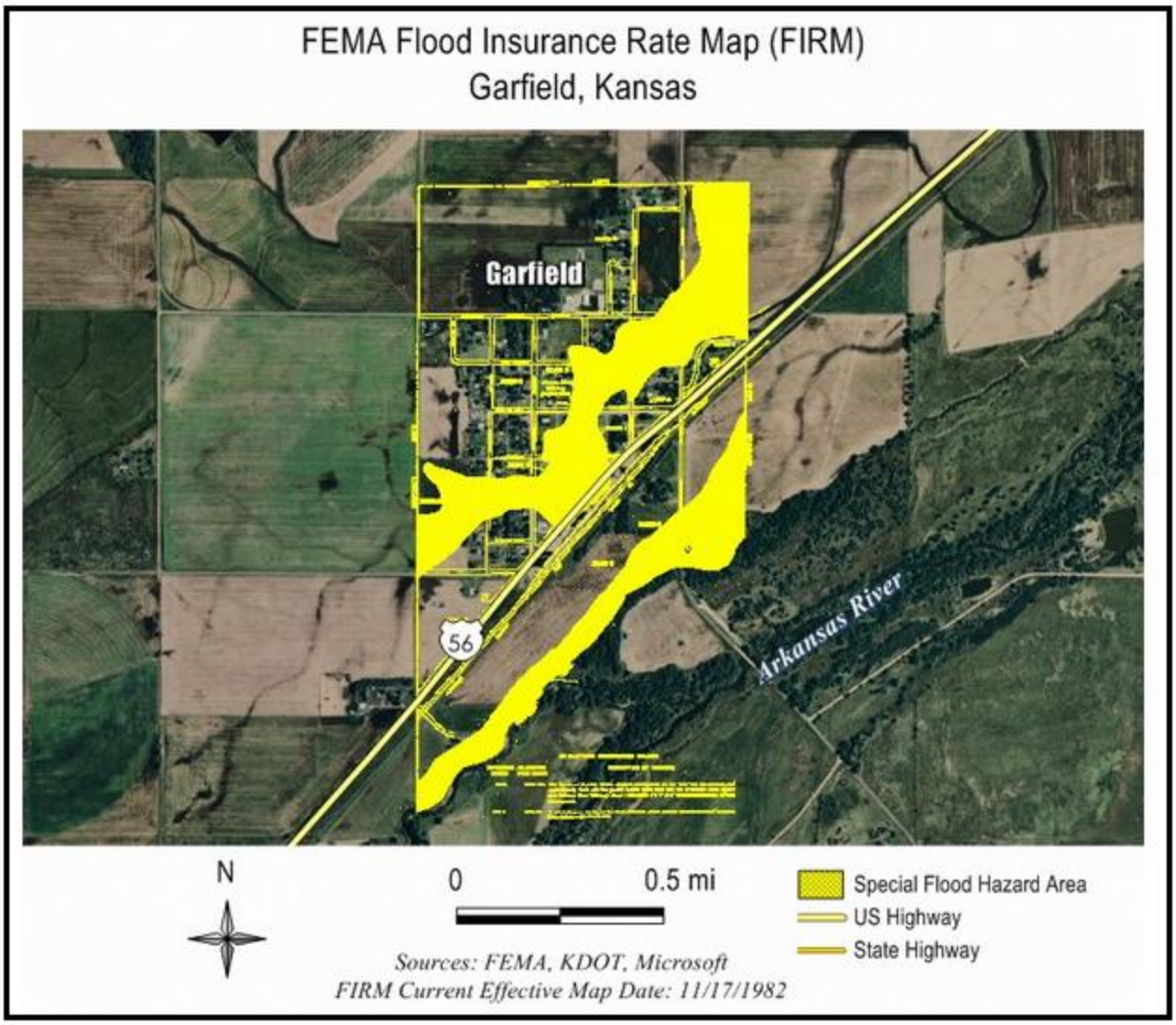

FEMA Special Flood Hazard Areas (SFHAs)
Kinsley, Kansas
Dry Coon Crk
Coon Crk
Kinsley
N 4TH ST
N 3RD ST
N 2ND ST
W 1ST ST
E 1ST ST
W 2ND ST
E 2ND ST
W 3RD ST
E 3RD ST
E 4TH ST
W 5TH ST
W 8TH ST
W 9TH ST
E 8TH ST
E 9TH ST
E 10TH ST
E 12TH ST
W 12TH ST
PARK RD
E 13TH ST
W 14TH ST
WAVERLY AVE
CAPITAL AVE
ATWOOD AVE
MASSACHUSETTS AVE
WINCHESTER AVE
COLONY AVE
BRIGGS AVE
ELIZABETH AVE
MOCHA LN
DEPOT AVE
US-56 HWY
56
50
183
0
0.5 mi
N
US Highway
State Highway
City/County Road
Railroad
Water Body
Stream/Drainage
Incorporated Area
SFHAs
Zone A
Zone AE
Floodway in Zone AE
Zone AO
Sources: FEMA, KDOT, DASC, US Census, Microsoft
FEMA Digital Flood Insurance Rate Map (DFIRM)
Current Effective Map Date: 01/16/2008

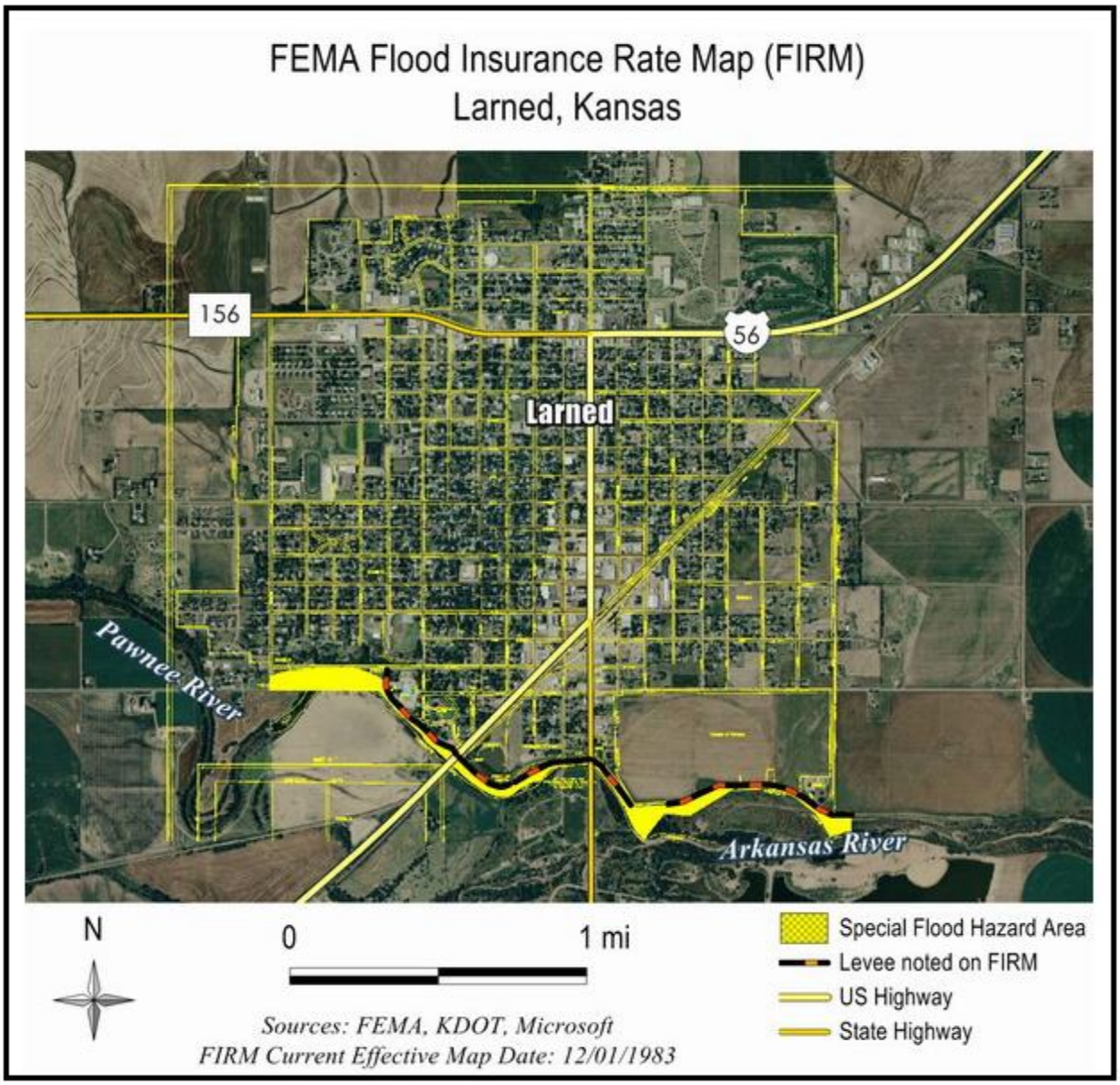

Flood Hazard Areas
Kiowa
County, KS
Kansas
Adjutant General
Division of Emergency Management
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
N
0
2
4
8 Miles
County Boundaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
Interstates
US Highways
Kansas Highways
Lake
Streams
Kiowa
Barber
Comanche
Haviland
Greensburg
Mullinville
Bucklin
Sun City
54
183
400
34

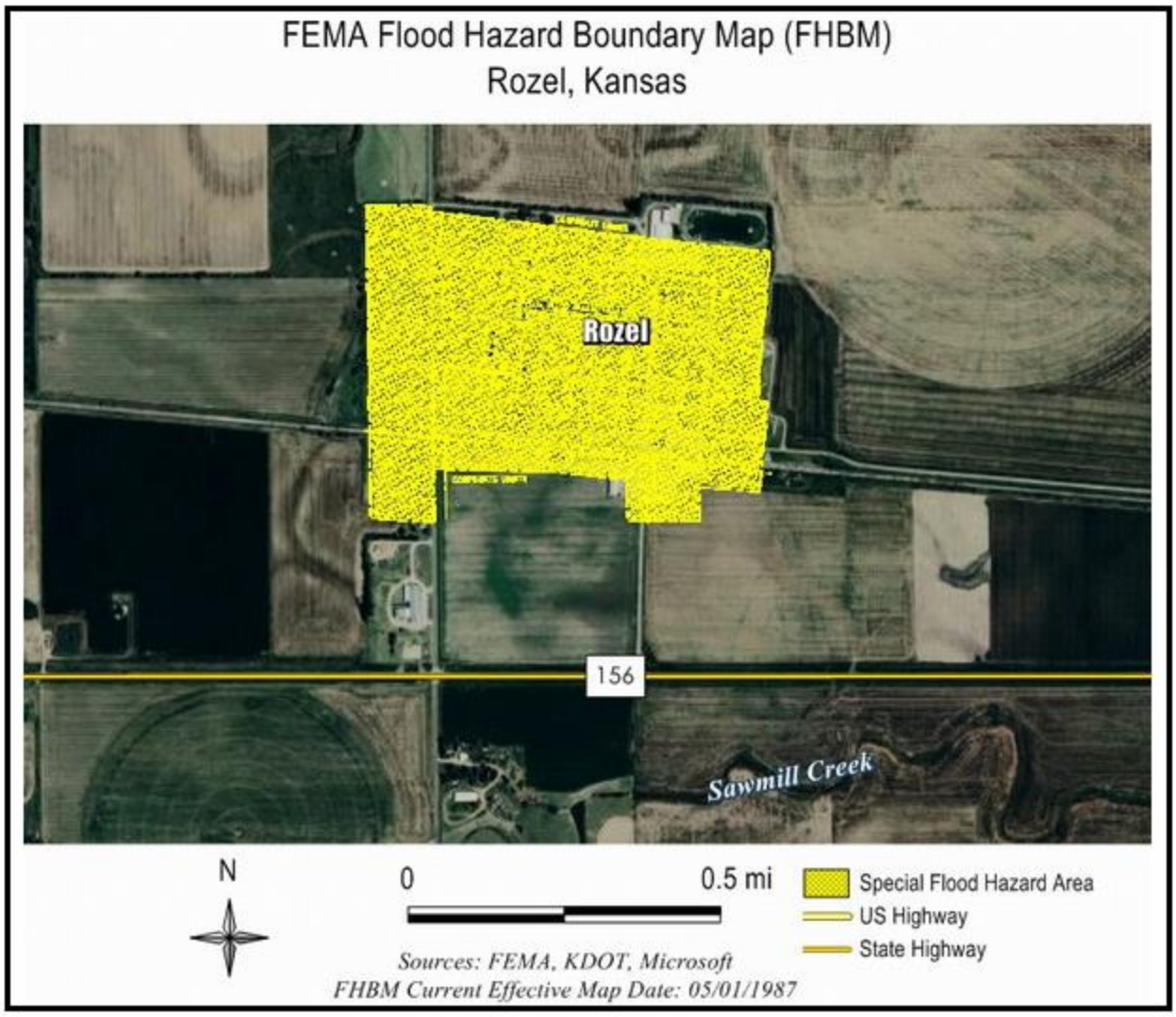

Great Bend
Radium
Pawnee Rock
Larned
Garfield
Rozel
Burdett
Pawnee
Edwards
Flood Hazard Areas
Pawnee
County, KS
Kansas
Division of Emergency Management
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
County Boundaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
Interstates
US Highways
Kansas Highways
Lake
Streams
N

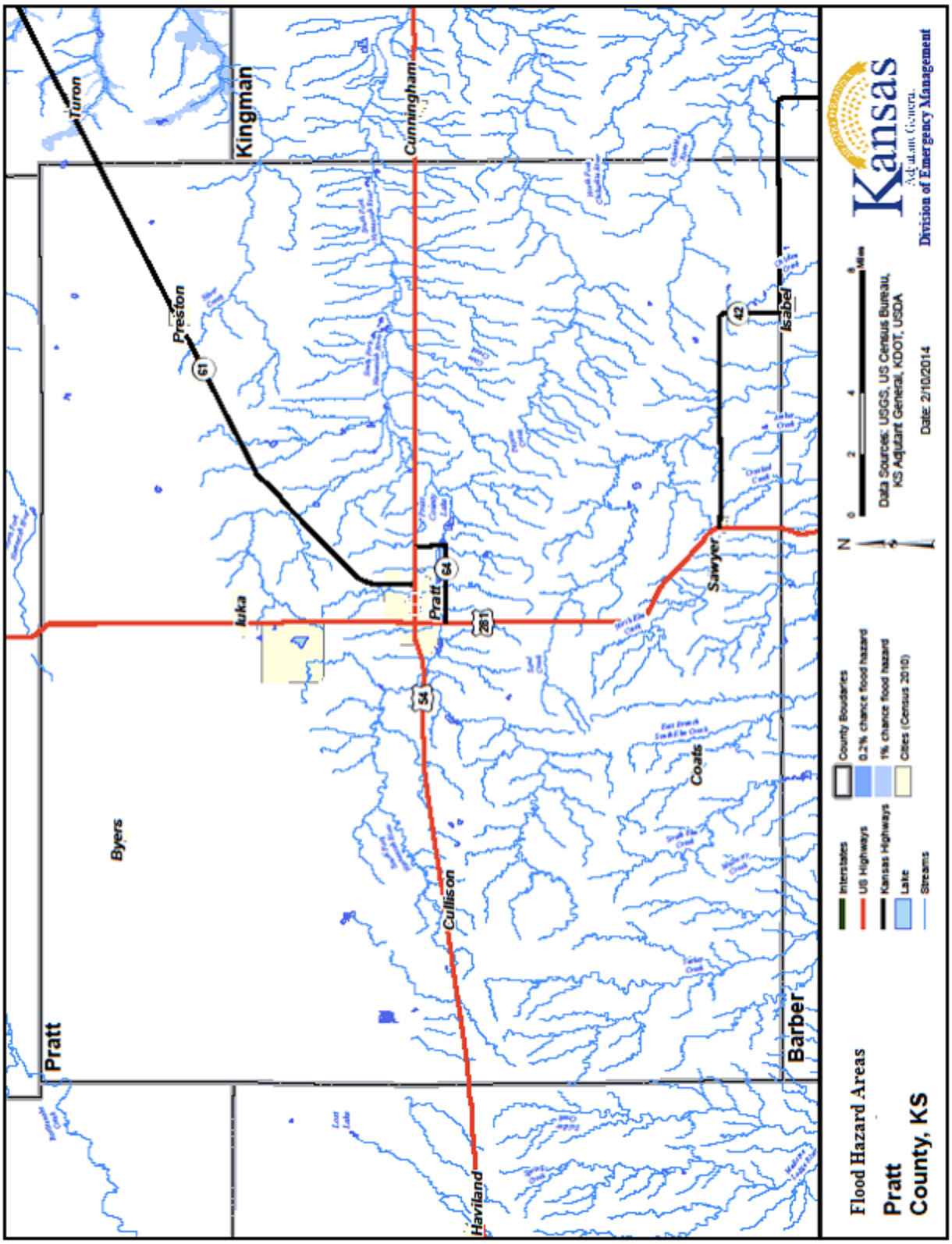
FEMA FIRM Panel, Pawnee County



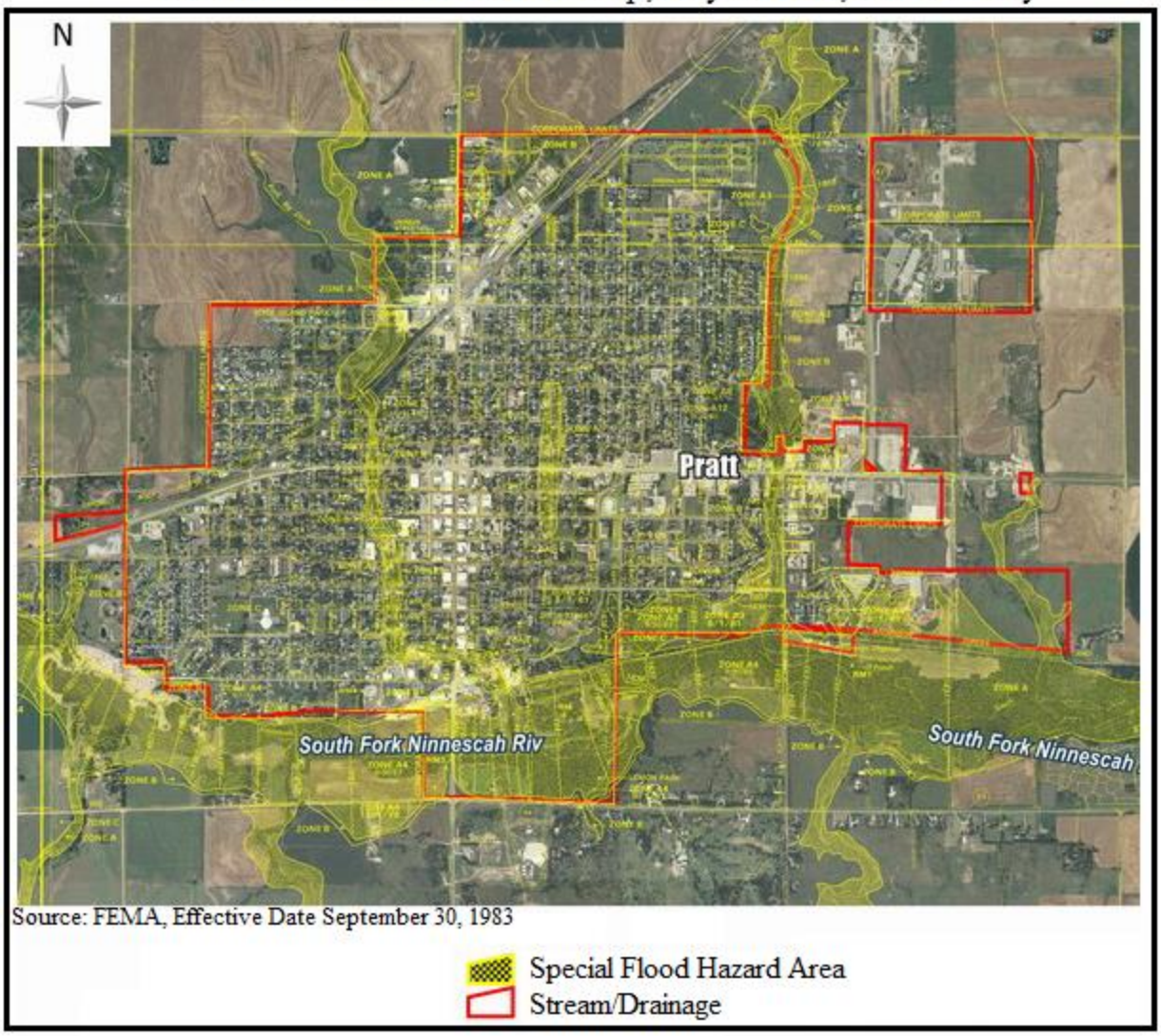

FEMA Flood Insurance Rate Map (FIRM)
Garfield, Kansas
Garfield
56
Arkansas River
N
0
0.5 mi
Special Flood Hazard Area
US Highway
State Highway
Sources: FEMA, KDOT, Microsoft
FIRM Current Effective Map Date: 11/17/1982


FEMA Flood Insurance Rate Map (FIRM)
Larned, Kansas
156
56
Larned
Pawnee River
Arkansas River
N
0
1 mi
Special Flood Hazard Area
Levee noted on FIRM
US Highway
State Highway
Sources: FEMA, KDOT, Microsoft
FIRM Current Effective Map Date: 12/01/1983

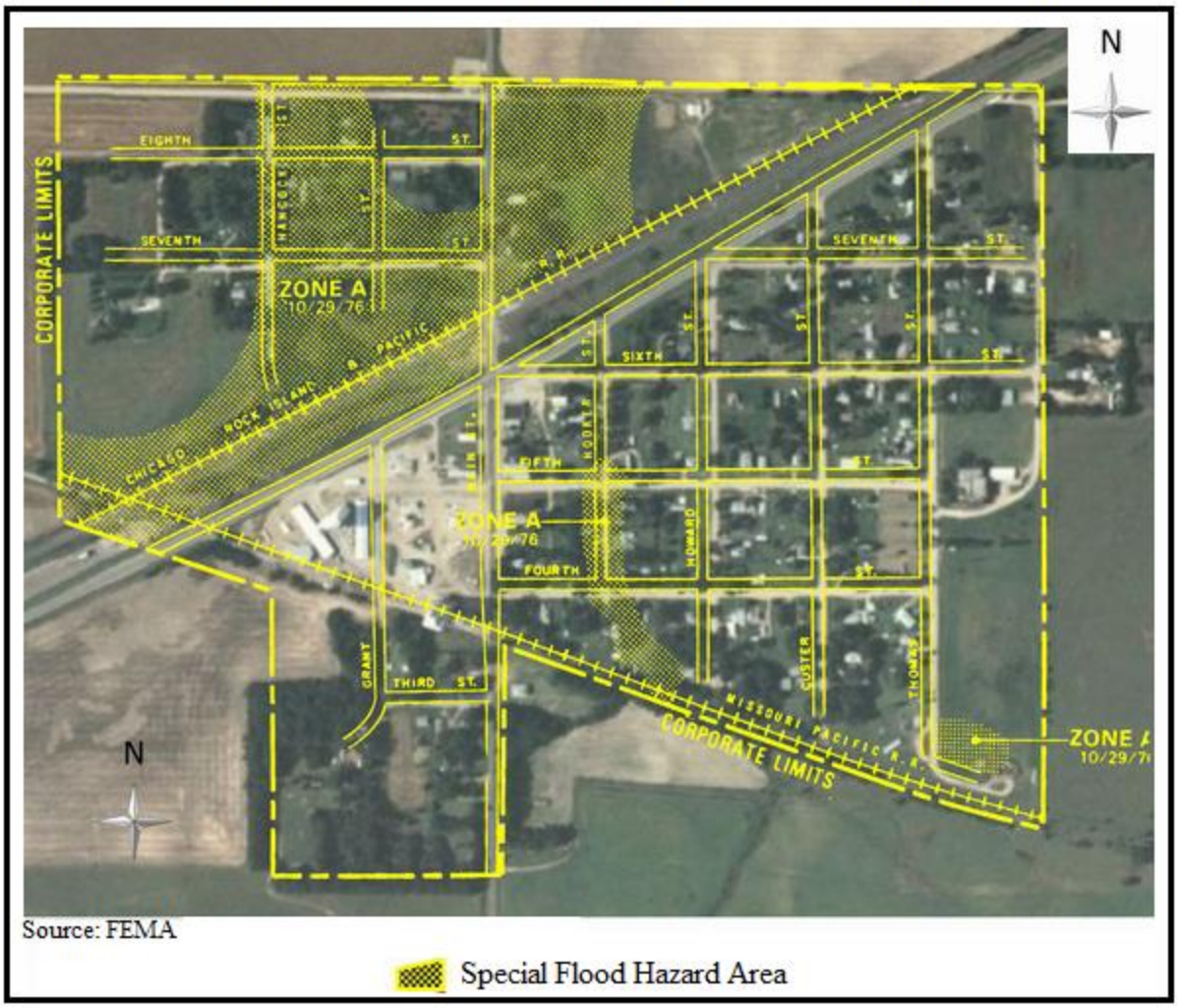

FEMA Flood Hazard Boundary Map (FHBM)
Rozel, Kansas
Rozel
156
Sawmill Creek
N
0
0.5 mi
Special Flood Hazard Area
US Highway
State Highway
Sources: FEMA, KDOT, Microsoft
FHBM Current Effective Map Date: 05/01/1987


Flood Hazard Areas
Pratt County, KS
Kansas
Adjutant General
Division of Emergency Management
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
County Boundaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
Interstates
US Highways
Kansas Highways
Lake
Streams
Turon
Kingman
Cunningham
Preston
Isabel
Sawyer
Iuka
Pratt
Byers
Coats
Cullison
Barber
Haviland

FEMA Flood Insurance Rate Map, City of Pratt, Pratt County

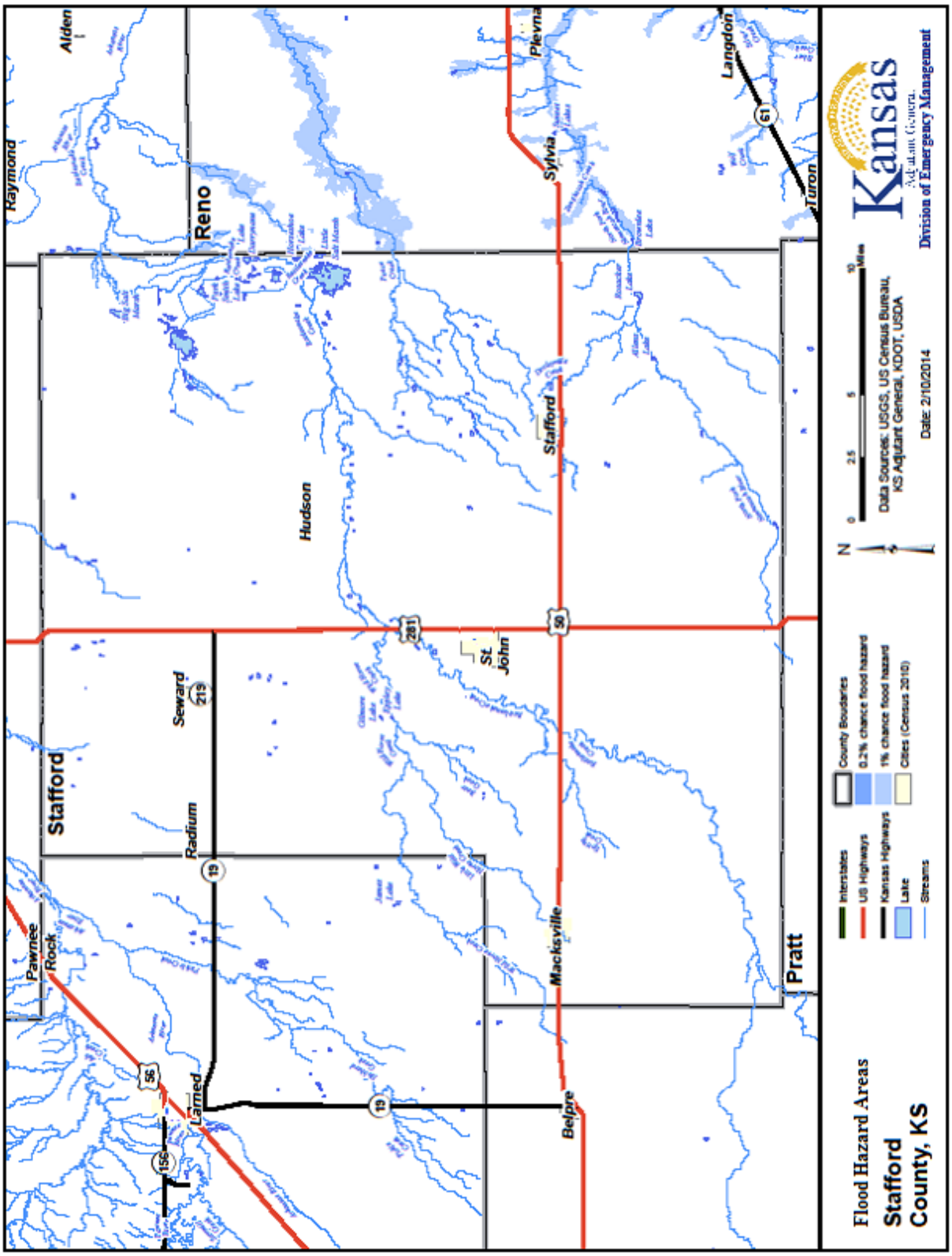


FEMA Flood Insurance Rate Map, City of Preston, Pratt County



Source: FEMA

Special Flood Hazard Area


Flood Hazard Areas
Stafford
County, KS
Kansas
Adjutant General
Division of Emergency Management
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
N
0
2.5
5
10 Miles
County Boundaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
Interstates
US Highways
Kansas Highways
Lake
Streams
Alden
Raymond
Reno
Plevna
Sylvia
Langdon
Turon
Hudson
Stafford
St John
Seward
Radium
Pawnee Rock
Larned
Macksville
Belpre
Pratt
281
50
19
56
156
61
213

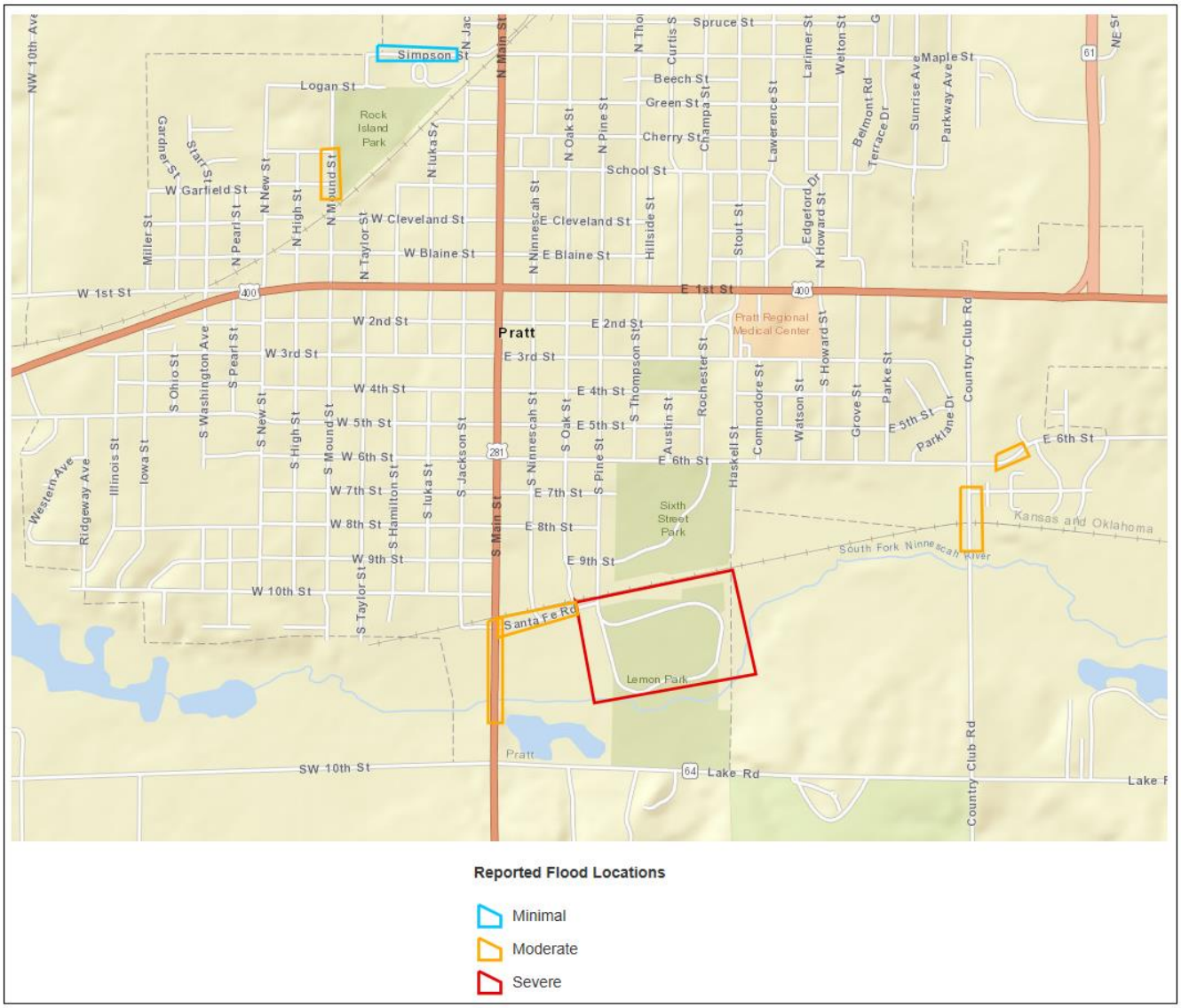
Local Concerns

The following detail specific local concerns as related to flooding:

- In Barber County properties located in or near the floodplains are the most vulnerable to flood events. The City of Medicine Lodge has some businesses, critical facilities, elderly, and low-income families located in flood hazard area. The types of residential structures include brick and mortar, wood, and modular homes.
- In Barton County, the City of Albert, including most of the residential and commercial facilities, is in located in the flood zone, with Zone AH covering most of the southern portion of the town and Zone AE for the northern portion. The eastern corporate limits of the City of Ellinwood are designated Zone AE, with some Zone A in the southeast corner of the town. The majority of the City of Great Bend lies within Zone X, protected by levee, and is classified as outside the 100-year floodplain while smaller, unimproved areas of the city are located within Zone A. The City of Hoisington has a Zone AH flood area located within the city limits, which trends north to south along the western boundary of the town. The City of Pawnee Rock has residential and commercial improvements located within a Zone AH. The City of Claflin has one small flood area, less than one percent of the corporate limits, located along the extreme western boundary of the town.
- In Edwards County, the City of Kinsley is located within an identified flood areas, including Zones A, AE, AO.
- In Pawnee County, the City of Burdett has two primary flood zones, both Zone A, one in the northern portion of the city and one in the southeast corner of the corporate limits. The City of Garfield has two primary flood zones, one Zone A lying southeast of the Santa Fe rail line following Old Coon Creek and one Zones A, A2, and B zones northwest of the railroad tracks in proximity to Garfield Drain. The entirety of the corporate limits of the City of Rozel is a Zone A flood area. The City of Larned has one primary flood zone along the Pawnee River, including Zones A6, B and C.
- In Pratt County, the City of Pratt has several flood hazard areas within the town including one on the west side town identified as Big Ditch, one along the Valley View Ditch, and one in the central portion of town between School and Fourth Streets. The City of Preston has an identified flood hazard Zone A located northwest of the Chicago Rock Island and Pacific Railroad tracks and a small area in the southeast corner of the town bordering the city limits identified as Zone A. USD 382's Pratt High School is located in an identified SFHA Zone A. USD 382 does not currently have flood insurance for its facilities.

Many local jurisdictions are subject to areas of repeat flooding. In an effort to identify these areas the KDA, in conjunction with the USACE Silver Jackets, has created a mapping system under the Recurring Flood Identification Project. This system allows for the local mapping of known flood areas within regional jurisdictions. Three classifications of flooding areas are used, minimal moderate and severe. The following areas of the City of Pratt were mapped.

USACE Silver Jackets Mapped Recurring Flood Areas, City of Pratt, Pratt County



4.13.2 – Previous Occurrences

In the 20-year period from 1999 to present, there have been 14 Presidential Disaster Declarations for Kansas Region E for floods (along with other associates hazard events such as tornados or severe storms). The following 20-year information on past declared disasters is presented to provide a historical perspective on flood events that have impacted Kansas Region E. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2013.

Table 4.62: Kansas Region E FEMA Flood Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28-07/12/2019)	Severe Storms, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Pawnee, and Pratt	$590,356
4417	02/25/2019 (10/04-10/15/2018)	Severe Storms, Straight-line Winds, And Flooding	Barber, Barton, and Pratt	$445,154
4403	10/19/2018 (09/01-09/08/2019)	Severe Storms, Straight-line Winds, And Flooding	Barber, Kiowa, And Pratt	$1,343,151
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, Tornados, Straight-line Winds, and Flooding	Barton and Edwards	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, Straight-line Winds, Tornados, and Flooding	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Kiowa, Pawnee, and Pratt	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, Tornados, Straight-line Winds and Flooding	Edwards, Kiowa, and Stafford	$6,923,919
4010	07/29/2011 (5/19-6/4/2011)	Severe Storms, Straight-line Winds, Tornados and Flooding	Barton and Stafford	$8,259,620
1932	08/10/2010 (6/7-7/21/2010)	Severe Storms, Flooding and Tornados	Comanche, Kiowa, and Pawnee	$9,279,257
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, Straight-line Winds, and Tornados	Barber	$15,013,488
1776	07/09/2008	Severe Storms, Flooding, and Tornados	Barber, Barton, Comanche, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$70,629,544
1711	7/2/2007 (6/26-30/2007)	Severe Storms and Flooding	Edwards and Pawnee	$40,238,600
1699	5/6/2007 (5/4/2007)	Severe Storms, Tornados, and Flooding	Barton, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$117,565,269
1579	2/8/2005 (1/4-6/2005)	Severe Winter Storm, Heavy Rains, and Flooding	Barber, Comanche, Kiowa, and Pratt	$106,873,672
1535	8/3/2004 (6/12-7/25/2004)	Severe Storms, Flooding, and Tornados	Barton and Pawnee	$12,845,892

Source: FEMA
-: Data unavailable

The following provides details concerning Presidential Disaster Declarations DR 4230 for Kansas Region E. FEMA summary writeups concerning declarations DR-4449, DR-4417 and DR-4403 were unavailable.

Kansas – Severe Storms, Tornados, Straight-Line Winds, and Flooding
FEMA-4230-DR
Declared July 20, 2015

On July 1, 2015, Governor Sam Brownback requested a major disaster declaration due to severe storms, tornados, straight-line winds, and flooding during the period of May 4 to June 21, 2015. The Governor requested a declaration for Public Assistance, including direct federal assistance for 42 counties and Hazard Mitigation statewide. During the period of May 4 to June 27, 2015, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On July 20, 2015, President Obama declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, tornados, straight-line winds, and flooding in Atchison, Barton, Brown, Barber, Chase, Chautauqua, Cherokee, Cheyenne, Clay, Cloud, Barton, Barton, Doniphan, Edwards, Elk, Ellsworth, Comanche, Gray, Greenwood, Comanche, Haskell, Hodgeman, Jackson, Jefferson, Jewell, Lyon, Pratt, Marshall, Pawnee, Meade, Kiowa, Morris, Nemaha, Neosho, Pawnee, Pottawatomie, Republic, Rice, Stevens, Sumner, Wabaunsee, and Washington Counties. Direct Federal assistance was also authorized. Finally, this declaration made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified flood events and the resulting damage totals in Kansas Region E from the period 2009 - 2018. This data is limited to reported events.

Table 4.63: Kansas Region E NCEI Flood and Flash Flood Events, 2009 - 2018

County	Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
Barber	Flood	4	$20,000	0	0
	Flash Flood	1	$0	0	0
Barton	Flood	15	$14,000	0	0
	Flash Flood	6	$472,600	0	0
Comanche	Flood	2	$0	0	0
	Flash Flood	2	$0	0	0
Edwards	Flood	2	$0	0	0
	Flash Flood	1	$0	0	0
Kiowa	Flood	3	$0	0	0
	Flash Flood	0	$0	0	0
Pawnee	Flood	3	$0	0	0
	Flash Flood	2	$0	0	0
Pratt	Flood	4	$2,500,000	0	0

Table 4.63: Kansas Region E NCEI Flood and Flash Flood Events, 2009 - 2018

County	Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
	Flash Flood	3	$0	0	0
Stafford	Flood	1	$0	0	0
	Flash Flood	1	$0	0	0

Source: FEMA

The following provides local accounts of notable flood events:

- **October 9, 2018: Pratt County**
  Heavy rainfall and runoff caused extensive flooding along the Ninnescah river flooding the city park, Memorial lake and the Kansas Department of Wildlife offices and rearing ponds. At the lake, several vehicles, tents and campers were inundated by flood waters. At the fish hatchery at the KDWP offices, many of the ponds were breached washing fingerling fish and brood fish out into the swollen river. Damages were reported at $2,500,000.

- **August 4, 2013: Great Bend, Barton County**
  Numerous stalled cars were reported across town from high water. Some water rescues occurred in town from people in stalled cars. Great Bend Airport reported 4.49 inches of rainfall in less than a 6-hour period. Damages were reported at $350,000

- **September 9. 2009: Barber County**
  Excessive rainfall earlier on the 8th finally reached a few creeks and the result was flooding. Unofficial amounts of over 10 inches was reported in the northwest part of Barber county. Damages were reported at $20,000.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of flooding on the Region's agricultural base. Crop loss data for the years 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicate 51 flood related claims on 12,914acres for $254,530.

Table 4.64: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Flooding

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	0	0	$0
Barton	17	726	$38,729
Comanche	0	0	$0
Edwards	7	480	$23,338
Kiowa	1	123	$4,913
Pawnee	12	503	$32,558
Pratt	2	102	$2,945
Stafford	12	980	$152,047

Source: USDA Farm Service Agency

4.13.3 – Hazard Probability Analysis

The following table summarizes riverine flood probability data for **Barber County**.

Table 4.65: Barber County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	4
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$20,000
Average Property Damage per Year	$2,000

Source: NCEI

Data from the NCEI indicates that Barber County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $2,000 in property damages

The following table summarizes flash flood probability data for **Barber County**.

Table 4.66: Barber County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	1
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Barber County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Barber County.**

Table 4.67: Barber County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: USDA

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to flooding occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes riverine flood probability data for **Barton County**.

Table 4.68: Barton County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	15
Average Events per Year	1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$14,000
Average Property Damage per Year	$1,400

Source: NCEI

Data from the NCEI indicates that Barton County can expect on a yearly basis, relevant to riverine flood events:

- One event
- No deaths or injuries
- $1,400 in property damages

The following table summarizes flash flood probability data for **Barton County**.

Table 4.69: Barton County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	6
Average Events per Year	1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$472,600
Average Property Damage per Year	$47,260

Source: NCEI

Data from the NCEI indicates that Barton County can expect on a yearly basis, relevant to flash flood events:

- One event
- No deaths or injuries
- $47,260 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Barton County.**

Table 4.70: Barton County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	17
Average Number of Claims per Year	2
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	726
Average Number of Acres Damaged per Year	73
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$38,729
Average Crop Damage per Year	$3,873

Source: USDA

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to flooding occurrences:

- Two insurance claims
- 73 acres impacted
- $3,873 in insurance claims

The following table summarizes riverine flood probability data for **Comanche County**.

Table 4.71: Comanche County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	2
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Comanche County**.

Table 4.72: Comanche County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	2
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0

Table 4.72: Comanche County Flash Flood Probability Summary

Data	Recorded Impact
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Comanche County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Comanche County.**

Table 4.73: Comanche County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: USDA

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to flooding occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes riverine flood probability data for **Edwards County**.

Table 4.74: Edwards County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	2
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries

- $0 in property damages

The following table summarizes flash flood probability data for **Edwards County**.

Table 4.75: Edwards County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	1
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Edwards County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Edwards County.**

Table 4.76: Edwards County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	7
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	480
Average Number of Acres Damaged per Year	48
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$23,338
Average Crop Damage per Year	$2,334

Source: USDA

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to flooding occurrences:

- One insurance claim
- 48 acres impacted
- $2,334 in insurance claims

The following table summarizes riverine flood probability data for **Kiowa County**.

Table 4.77: Kiowa County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	3
Average Events per Year	<1

Table 4.77: Kiowa County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Kiowa County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Kiowa County**.

Table 4.78: Kiowa County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	0
Average Events per Year	0
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Kiowa County can expect on a yearly basis, relevant to flash flood events:

- No events
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Kiowa County.**

Table 4.79: Kiowa County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	1
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	123
Average Number of Acres Damaged per Year	12
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$4,913
Average Crop Damage per Year	$491

Source: USDA

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claim
- 12 acres impacted
- $491 in insurance claims

The following table summarizes riverine flood probability data for **Pawnee County**.

Table 4.80: Pawnee County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	3
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Pawnee County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Pawnee County**.

Table 4.81: Pawnee County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	2
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Pawnee County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes flood event data for **Pawnee County.**

Table 4.82: Pawnee County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	12
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	503
Average Number of Acres Damaged per Year	50
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$32,558
Average Crop Damage per Year	$3,256

Source: USDA

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to flooding occurrences:

- One insurance claim
- 50 acres impacted
- $3,256 in insurance claims

The following table summarizes riverine flood probability data for **Pratt County**.

Table 4.83: Pratt County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	2
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Pratt County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Pratt County**.

Table 4.84: Pratt County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	4
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$2,500,000
Average Property Damage per Year	$250,000

Source: NCEI

Data from the NCEI indicates that Pratt County can expect on a yearly basis, relevant to flash flood events:

- <1 events
- No deaths or injuries
- $250,000 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Pratt County.**

Table 4.85: Pratt County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	102
Average Number of Acres Damaged per Year	10
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,945
Average Crop Damage per Year	$295

Source: USDA

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claim
- Ten acres impacted
- $295 in insurance claims

The following table summarizes riverine flood probability data for **Stafford County**.

Table 4.86: Stafford County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	1
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Stafford County can expect on a yearly basis, relevant to riverine flood events:

- <1event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Stafford County**.

Table 4.87: Stafford County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	1
Average Events per Year	<1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Stafford County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Stafford County.**

Table 4.88: Stafford County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	12
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	980
Average Number of Acres Damaged per Year	98
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$152,047
Average Crop Damage per Year	$15,205

Source: USDA

According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to flooding occurrences:

- One insurance claim
- 98 acres impacted
- $15,205 in insurance claims

In addition, Kansas Region E has had 14 Presidentially Declared Disasters relating to flooding (and other causes) in the last 20 years. This represents an average of one declared flood disaster per year.

4.13.4 – Vulnerability Analysis

The results of the HAZUS analysis were utilized to estimate potential losses for riverine flooding. The intent of this analysis was to enable Kansas Region E to estimate where flood losses could occur and the degree of severity using a consistent methodology. The HAZUS model helps quantify risk along known flood-hazard corridors as well as lesser streams and rivers that have a drainage area of 10 square miles or more.

HAZUS determines the displaced population based on the inundation area, not necessarily impacted buildings. As a result, there may be population vulnerable to displacement even if the structure is not vulnerable to damage. Individuals and households will be displaced from their homes even when the home has suffered little or no damage either because they were evacuated or there was no physical access to the property because of flooded roadways.

Flood sheltering needs are based on the displaced population, not the damage level of the structure. HAZUS determines the number of individuals likely to use government-provided short-term shelters through determining the number of displaced households as a result of the flooding. To determine how many of those households and the corresponding number of individuals will seek shelter in government-provided shelters, the number is modified by factors accounting for income and age. Displaced people using shelters will most likely be individuals with lower incomes and those who do not have family or friends within the immediate area. Since the income and age factors are taken into account, the proportion of displaced population and those seeking shelter will vary from county to county.

Additionally, HAZUS takes into account flood depth when modeling damage (based on FEMA's depth-damage functions). Generated reports capture damage by occupancy class (in terms of square footage impacted) by damage percent classes. Occupancy classes include agriculture, commercial, education, government, industrial, religion, and residential. Damage percent classes are grouped by 10 percent increments up to 50%. Buildings that sustain more than 50% damage are considered to be substantially damaged.

The following table provides the HAZUS results for vulnerable populations and the population estimated to seek short term shelter as well as the numbers of damaged and substantially damaged buildings for each Kansas Region E county.

Table 4.89: Kansas Region E HAZUS Flood Scenario Displaced Population Building Damages

County	Population Vulnerable to Displacement	Population with Short Term Shelter Needs	Vulnerable Buildings	Damaged Buildings	Substantially Damaged Buildings
Barber	116	6	160	13	0
Barton	2887	1582	3319	217	0
Comanche	39	0	25	1	0
Edwards	526	115	346	59	0
Kiowa	25	0	7	0	0
Pawnee	371	101	516	4	0
Pratt	99	6	103	1	0
Stafford	326	44	387	33	0

Source: FEMA and HAZUS

The HAZUS analysis also provides an estimate the repair costs for impacted buildings as well as the associated loss of building contents and business inventory. Building damage can also cause additional losses to a community by restricting a building's ability to function properly. Income loss data accounts for losses such as business interruption and rental income losses as well as the resources associated with damage repair and job and housing losses. These losses are calculated by HAZUS using a methodology based on the building damage estimates.

The damaged building counts generated by HAZUS are susceptible to rounding errors and are likely the weakest output of the model due to the use of census blocks for analysis. Generated reports include this disclaimer: "Unlike the earthquake and hurricane models, the flood model performs its analysis at the census block level. This means that the analysis starts with a small number of buildings within each census block and applies a series of distributions necessary for analyzing the potential damage. The application of these distributions and the small number of buildings make the flood model more sensitive to rounding errors that introduces uncertainty into the building count results." Additionally, losses are not calculated for individual buildings, but instead are based on the performances of entire classes of buildings obtained from the general building stock data. In the flood model, the number of grid cells (pixels) at each flood depth value is divided by the total number of grid cells in the census block. The result is used to weight the flood depths applied to each specific occupancy type in the general building stock. First floor heights are then applied to determine the damage depths to analyze damages and losses. The following table provides the HAZUS results for building damages and lost income due to these damages.

Table 4.90: Kansas Region E HAZUS Flood Scenario Structural Damage and Income Loss

County	Structural Damage	Contents Damage	Inventory Loss	Total Direct Loss	Total Income Loss	Total Direct and Income Loss
Barber	$2,543,000	$3,870,000	$287,000	$6,700,000	$11,000	$6,711,000
Barton	$27,090,000	$54,972,000	$7,552,000	$89,614,000	$480,000	$90,094,000
Comanche	$370,000	$178,000	$8,000	$556,000	$0	$556,000
Edwards	$3,169,000	$2,804,000	$50,000	$6,023,000	$25,000	$6,048,000
Kiowa	$253,000	$106,000	$0	$359,000	$0	$359,000
Pawnee	$2,379,000	$1,537,000	$21,000	$3,937,000	$32,000	$3,969,000
Pratt	$1,288,000	$745,000	$26,000	$2,059,000	$1,000	$2,060,000
Stafford	$3,106,000	$4,956,000	$224,000	$8,286,000	$96,000	$8,382,000

Source: FEMA and HAZUS

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years) allows us to quantify the monetary impact of flood conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to flood events.

Table 4.91: Flood Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	0	0.00%	$93,568,000	$0	0.00%
Barton	557,961	73	0.01%	$365,672,000	$3,873	0.00%
Comanche	453,556	0	0.00%	$51,803,000	$0	0.00%
Edwards	392,025	48	0.01%	$228,780,000	$2,334	0.00%
Kiowa	442,981	12	0.00%	$78,281,000	$491	0.00%
Pawnee	474,275	50	0.01%	$362,349,000	$3,256	0.00%
Pratt	465,191	10	0.00%	$271,307,000	$295	0.00%

Table 4.91: Flood Acres Impacted and Crop Insurance Paid per County from 2009-2018

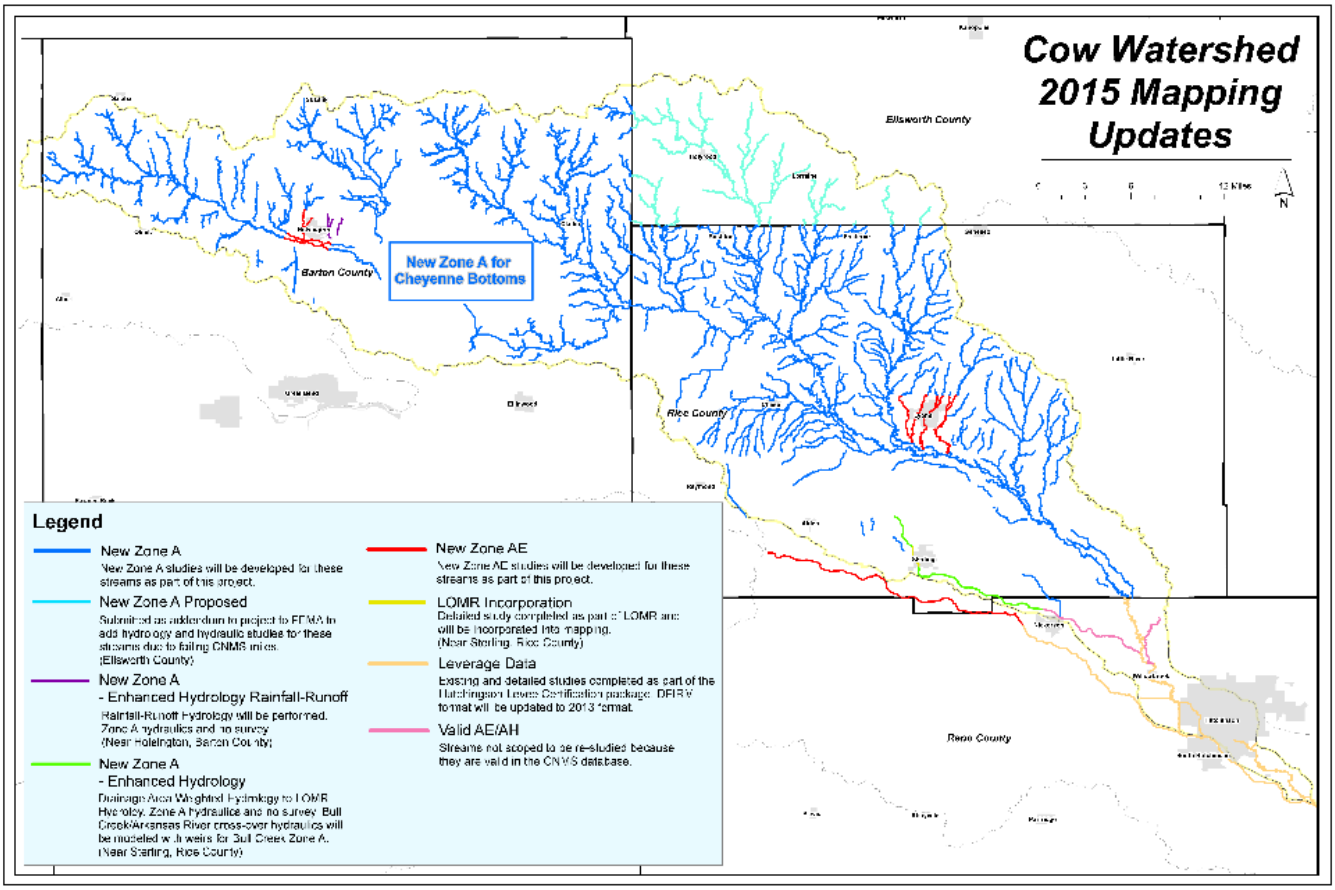
Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Stafford	493,694	98	0.02%	$198,573,000	$15,205	0.01%

Source: USDA

Flood risk can also change over time because of new building and development, weather patterns and other factors. Although the frequency or severity of impacts cannot be changed, FEMA is working with federal, state, tribal and local partners across the nation to identify flood risk and promote informed planning and development practices to help reduce that risk through the Risk Mapping, Assessment and Planning (Risk MAP) program. Risk MAP uses the watershed boundaries to conduct studies. This watershed approach allows communities to come together to develop partnerships, combine resources, share flood risk information with FEMA, and identify broader opportunities for mitigation action.

The Flood Risk Products and datasets present information that can enhance hazard mitigation planning activities, especially the risk and vulnerability assessment portion of a hazard mitigation plan, and the development of risk-based mitigation strategies. Risk MAP can also help guide land use and development decisions and help you take mitigation action by highlighting areas of highest risk, areas in need of mitigation, and areas of floodplain change. Currently Kansas Region E has no current Risk Map projects.

In 2015, a mapping project was completed on the Cow Watershed (HUC8 11030011), which lies within the Kansas Counties of Barton, Ellsworth, Reno, and Rice. This project consists of new detailed hydrologic and hydraulic studies using current watershed characteristics and new detailed topography for 51 stream miles of streams that will be modeled by detailed methods resulting in Zone AE floodplains with a floodway, and 912 stream miles of streams that will be studied by approximate methods resulting in updated Zone A floodplains. It was requested to perform enhanced hydrology on approximately 7.0 stream miles of Zone A streams based on a rainfall-runoff model, and to distribute enhanced hydrology on approximately 15.6 stream miles of Bull Creek, a Zone A stream, based on the extrapolation of flows from an effective Letter of Map Revision. In addition, statistical gage analysis was performed for approximately 66.4 stream miles of Cow Creek, which is a Zone A stream. For streams not included in a detailed hydrologic study, approximate Zone A hydrology was performed using localized regression equations, generated from the results of the detailed rainfall-runoff models that were developed for this watershed. The mapping results of this project are presented below.



Mold

Mold is plant-like organism that obtains nourishment it directly from surrounding organic materials. Mold can grow on a variety of materials and thrives in damp environments. As such, a recently flooded home or business provides an ideal environment for mold growth, especially on materials such as drywall and carpeting. The young, old and ill may be specifically susceptible to the effects of mold, with symptoms including:

- congestion
- cough
- breathing difficulties
- sore throat
- membrane irritation
- upper respiratory infections

As such, any instance of flood related mold should be remediated as soon as possible.

4.13.5 – National Flood Insurance Program Communities

The National Flood Insurance Program (NFIP) is a federal program, managed by FEMA, that exists to provide flood insurance for property owners in participating communities, to improve floodplain

management practices, and to develop maps of flood hazard areas. The following table presents the number of NFIP participating communities in each county.

Table 4.92: Kansas Region E NFIP Communities

Community	Initial Flood Hazard Boundary Map Identified	Initial Flood Insurance Rate Map Identified	Current Effective Map Date
Barber County			
Kiowa	12/13/1977	09/12/75	06/03/86
Medicine Lodge	02/08/74	07/26/74	07/03/90
Sharon	11/22/1974	08/22/75	-
Barton County			
Barton County	08/02/77	08/16/88	09/02/09
Claflin	08/15/75	09/02/09	09/02/09(M)
Ellinwood	03/15/74	09/01/78	09/02/09
Great Bend	03/19/76	05/16/83	09/02/09
Hoisington	02/22/74	02/05/86	09/02/09
Pawnee Rock	01/10/75	01/14/77	09/02/09
Susank	-	09/02/09	NSFHA
Comanche County			
Protection	07/02/76	02/01/05	02/01/05(L)
Edwards County			
Edwards County	-	01/16/08	01/16/08
Kinsley	05/17/74	03/01/78	01/16/08
Kiowa County			
Greensburg	07/30/76	02/01/87	02/01/87(L)
Haviland	08/22/75	-	08/22/75
Louisburg	03/01/74	08/19/08	08/19/08
Osawatomie	01/23/74	09/19/84	08/19/08
Paola	12/14/1973	04/17/78	08/19/08
Pawnee County			
Pawnee County	10/25/1977	02/01/90	02/01/90(L)
Burdett	03/26/76	03/01/05	03/01/05
Garfield	06/04/76	11/17/1982	11/17/1982
Larned	02/01/74	09/29/78	12/1/1983
Rozel	01/03/75	05/01/87	05/01/87(L)
Pratt County			
Pratt County	-	-	-
Pratt	04/05/74	11/1/1978	09/30/83
Preston	10/29/1976	-	10/29/1976
Stafford County			
City of Stafford	03/26/76	08/26/80	08/26/80(M)

Notes: NSFHA: No Special Flood Hazard Area - All Zone C
(L): Original FIRM by letter - All Zone A, C and X
(M): No elevation determined - All Zone A, C and X

Additionally, the NFIP's Community Rating System (CRS) incentive rewards communities for the work they do managing their floodplains. Eligible communities that qualify for this voluntary program go above the minimum NFIP requirements and can offer their citizens discounted flood insurance in both Special

Flood Hazard Areas (SFHAs) areas or non-SFHA areas. Additionally, work already being done by the state of Kansas (e.g., dam safety program and state freeboard requirements) gives communities additional discounts. The following Region E community is currently a CRS participant:

Table 4.93: Kansas Region E CRS Participating Jurisdictions

Jurisdiction	County	CRS Entry Date	CRS Class	% Discount for SFHA	% Discount for Non-SFHA	Status
Pratt	Pratt	5/1/2017	8	10%	5%	Current

Source: FEMA and KDEM

4.13.6 – FEMA Flood Policy and Loss Data

Kansas Region E flood-loss information was pulled from FEMA's "Policy and Loss Data by Community with County and State Data." There are several limitations to this data, including:

- Only losses to participating NFIP communities are represented
- Communities joined the NFIP at various times since 1978
- The number of flood insurance policies in effect may not include all structures at risk to flooding
- Some of the historical loss areas have been mitigated with property buyouts

Some properties are under-insured. The flood insurance purchase requirement is for flood insurance in the amount of federally backed mortgages, not the entire value of the structure. Additionally, contents coverage is not required.

The following table shows the details of NFIP policy and loss statistics for each county in Kansas Region E. Loss statistics include losses through December 31, 2018.

Table 4.94: Kansas Region E NFIP Policy and Loss Statistics, As of December 31, 2018

Jurisdiction	Number of Policies in Force	Insurance in Force	Number of Closed Losses	Total Payments
Barber County				
Kiowa	1	$350,000	0	$0
Medicine Lodge	5	$738,500	1	$1,219
Sharon	1	$45,500	0	$0
Barton County				
Barton County	59	$5,129,600	10	$53,492
Albert	17	$1,584.800	3	$4,177
Ellinwood	25	$3,310,200	12	$137,221
Great Bend	14	$2,691,600	414	$2,220,944
Hoisington	13	$1,422,100	7	$32,574
Pawnee Rock	16	$674,700	6	$20,851
Comanche County				
Protection	1	$78,600	0	$0
Edwards County				
Kinsley	88	$7,216,100	1	$1,108
Kiowa County				
Greenburg	2	$104,000	0	$0

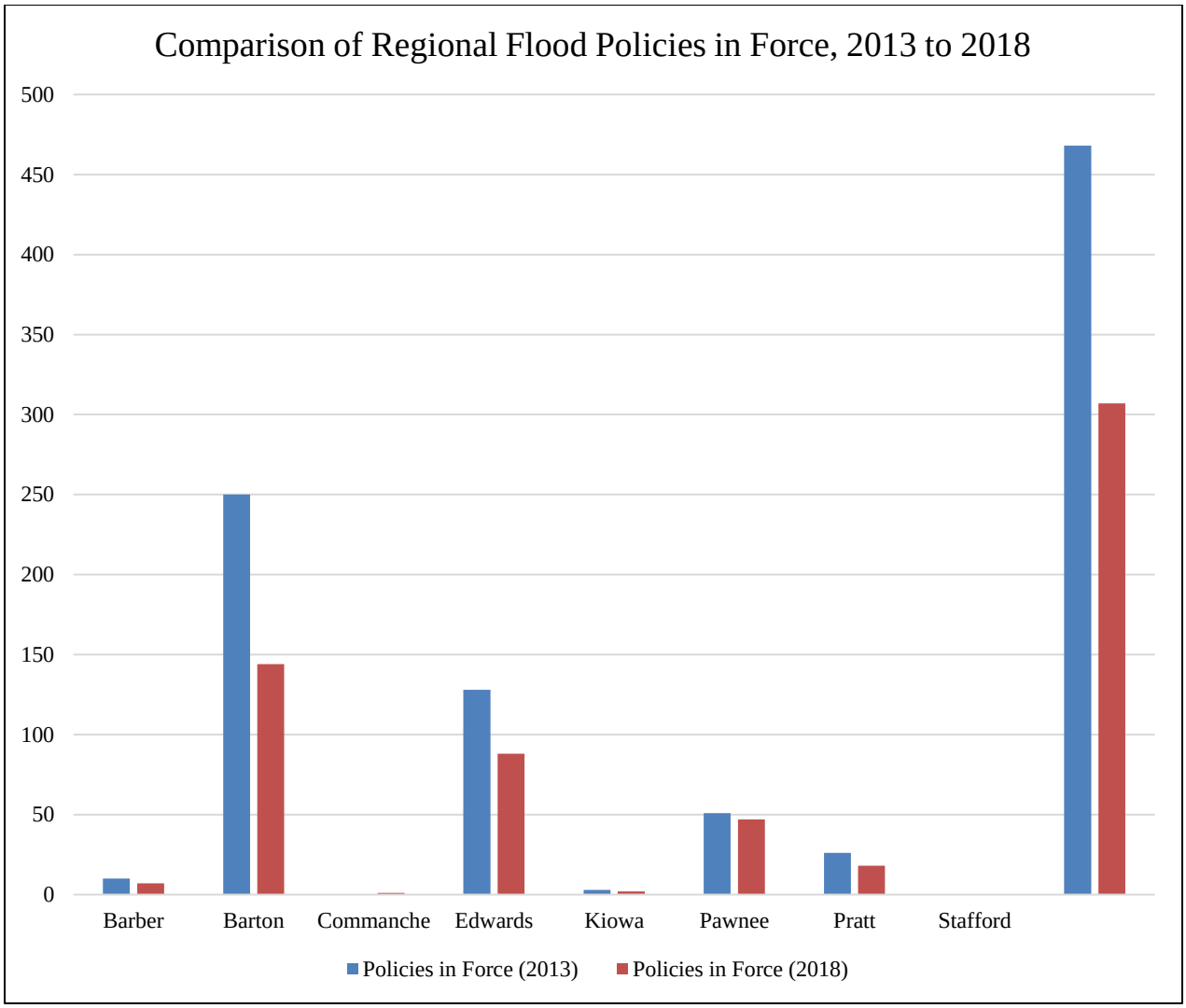
Table 4.94: Kansas Region E NFIP Policy and Loss Statistics, As of December 31, 2018

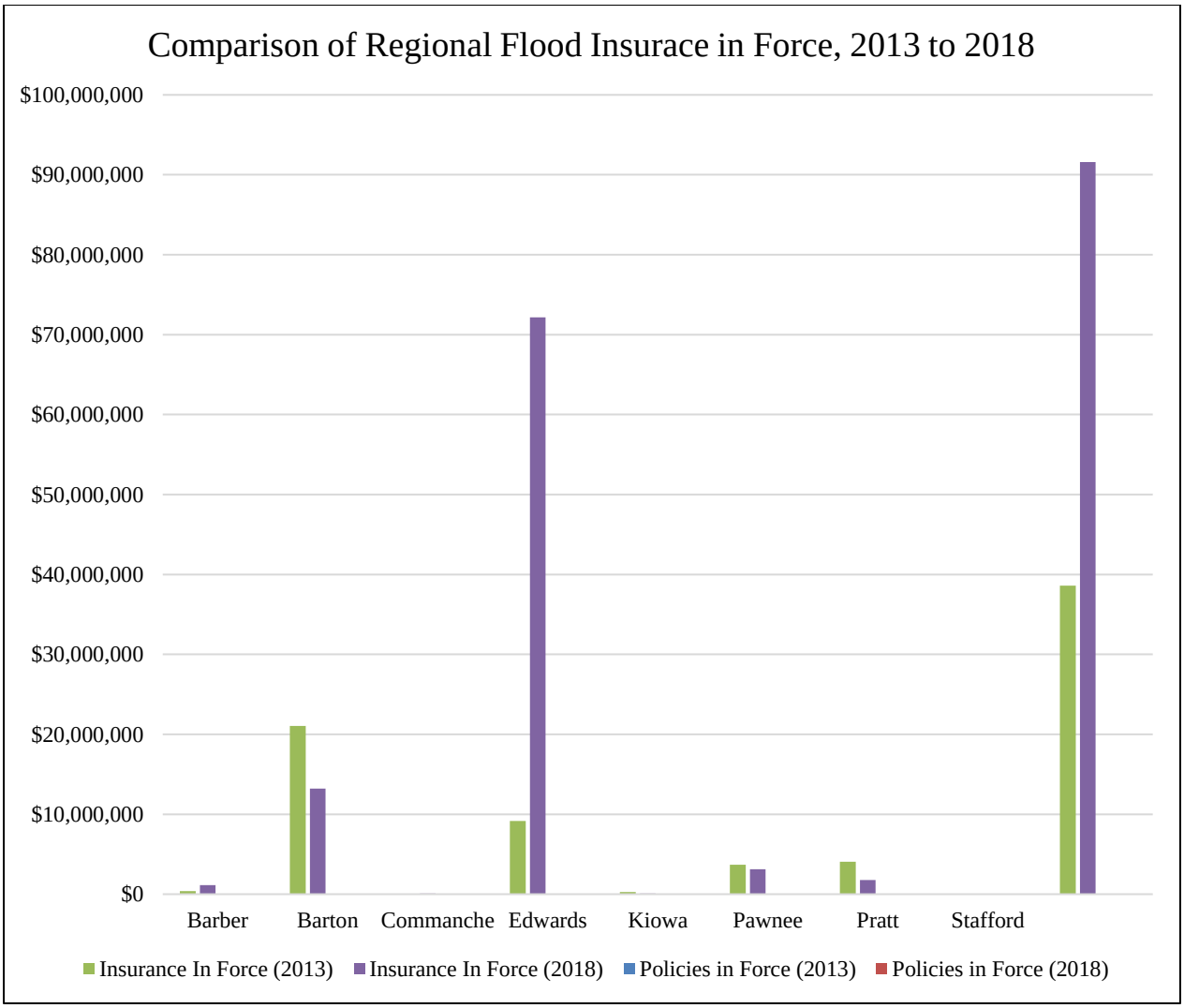
Jurisdiction	Number of Policies in Force	Insurance in Force	Number of Closed Losses	Total Payments
Pawnee County				
Pawnee County	30	$1,603,900	1	$2,943
Burdett	3	$182,000	0	$0
Rozel	14	$1,325,400	1	$1,202
Pratt County				
Pratt County	1	$350,000	0	$0
City of Pratt	17	$2,989,100	5	$2,009
Stafford County				
Stafford County	0	$0	0	$0

Source: FEMA, "Policy and Loss Data by Community with County and State Data"

The following graphs summarize data from the above table for Kansas Region E in comparison to 2013 data. Of note:

- Regionally the number of flood policies has decreased from 2013 to 2018, from 468 to 307
- Regionally the amount of flood insurance in-force decreased from 2013 to 2018, from $38,595,400 to $91,604,585
- Regionally the number of flood insurance closed losses and the dollar amount of those losses remained static (an increase of two losses) from 2013 to 2018


Comparison of Regional Flood Policies in Force, 2013 to 2018
500
450
400
350
300
250
200
150
100
50
0
Barber
Barton
Commanche
Edwards
Kiowa
Pawnee
Pratt
Stafford
Policies in Force (2013)
Policies in Force (2018)



4.13.7 – Repetitive Loss Properties

A high priority to Kansas Region E is the reduction of losses to Repetitive Loss (RL) and Severe Repetitive Loss (SRL) structures. The NFIP defines a RL property as:

- Any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978

At least two of the claims must be more than 10 days apart.

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or

- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both of the above, at least two of the referenced claims must have occurred within any ten-year period and must be greater than ten days apart.

The following table details RL and SRL properties in Kansas Region E.

Table 4.95: Kansas Region F Repetitive Loss Properties, As of December 2018

County Name	Community Name	Mitigated	Insured	Occupancy	Total Building Payment	Total Contents Payment	Losses	Total Paid
Barton	Ellinwood	No	Yes	Single Family	$27,762	$0	2	$27,762

4.13.8 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.96: Flood Consequence Analysis

Subject	Impacts of Flood
Health and Safety of the Public	Impact dependent on the level of flood waters. Individuals further away from the incident area are at a lower risk. Casualties are dependent on warning time.
Health and Safety of Responders	Impact to responders is expected to be minimal unless responders live within the affected area.
Continuity of Operations	Temporary relocation may be necessary if inundation affects government facilities.
Property, Facilities, and Infrastructure	Localized impact could be severe in the inundation area of the incident to facilities and infrastructure. The further away from the incident area the damage lessens.
Environment	Impact will be severe for impacted area. Impact will lessen with distance.
Economic Conditions	Impacts to the economy depend on the area flooded, depth of water, and the amount of time it takes for the water to recede.
Public Confidence in the Jurisdiction's Governance	Perception of whether the flood could have been prevented, warning time, and response and recovery time will greatly impact the public's confidence.

4.14 – Hailstorms

According to NOAA, hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere causing them to freeze. The raindrops form into small frozen droplets and then continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen rain droplet can continue to grow and form hail.

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4.14.1 – Location and Extent

Hailstorms occur over broad geographic regions. The entire planning area, including all participating jurisdictions, is at risk to hailstorms.

Based on information provided by the Tornado and Storm Research Organization, the following table describes typical damage impacts of the various sizes of hail.

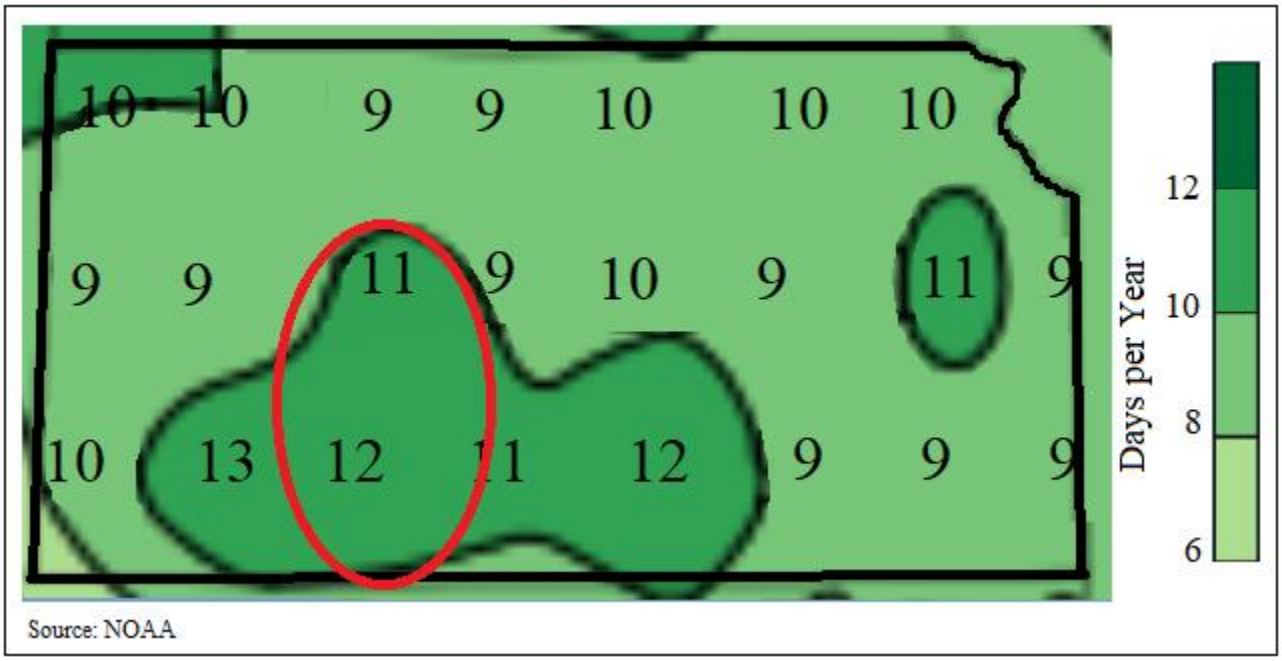
Table 4.97: Hailstorm Intensity Scale

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organization

The following map, generated by data compiled by NOAA, indicates the average number of severe hail event days for Kansas Region E (9).

Kansas Region E Severe Hail Days per Year from 2003 to 2012 Reports



4.14.2 – Previous Occurrences

In the 20-year period from 1999 to present, there have been 14 Presidential Disaster Declarations for Kansas Region E for severe storms (along with other associates hazard event), of which hail may be a component. The following 20-year information (with 1999 and 2018 being full data years) on past declared disasters is presented to provide a historical perspective on hail events that have impacted Kansas Region E. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2014.

Table 4.98: Kansas Region E FEMA Severe Storm Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28/2019 – 07/12/2019)	**Severe Storms**, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Pawnee, and Pratt	$590,356
4417	02/25/2019 (10/04-10/15/2018)	**Severe Storms**, Straight-line Winds, And Flooding	Barber, Barton, and Pratt	$445,154
4403	10/19/2018 (09/01-09/08/2019)	**Severe Storms**, Straight-line Winds, And Flooding	Barber, Kiowa, And Pratt	$1,343,151
4230	07/20/2015 (05/04/2015 – 06/21/2015)	**Severe Storms**, Tornados, Straight-line Winds, and Flooding	Barton and Edwards	$13,848,325

Table 4.98: Kansas Region E FEMA Severe Storm Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4150	10/22/2013 (07/22/2013 – 08/15/2013)	**Severe Storms**, Straight-line Winds, Tornados, and Flooding	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Kiowa, Pawnee, and Pratt	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	**Severe Storms**, Tornados, Straight-line Winds and Flooding	Edwards, Kiowa, and Stafford	$6,923,919
4010	07/29/2011 (5/19-6/4/2011)	**Severe Storms**, Straight-line Winds, Tornados and Flooding	Barton and Stafford	$8,259,620
1932	08/10/2010 (6/7-7/21/2010)	**Severe Storm**s, Flooding and Tornados	Comanche, Kiowa, and Pawnee	$9,279,257
1849	06/25/2009 (4/25-5/16/2009)	**Severe Storms**, Flooding, Straight-line Winds, and Tornados	Barber	$15,013,488
1776	07/09/2008	**Severe Storms**, Flooding, and Tornados	Barber, Barton, Comanche, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$70,629,544
1711	7/2/2007 (6/26-30/2007)	**Severe Storms** and Flooding	Edwards and Pawnee	$40,238,600
1699	5/6/2007 (5/4/2007)	**Severe Storms**, Tornados, and Flooding	Barton, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$117,565,269
1535	8/3/2004 (6/12-7/25/2004)	**Severe Storms**, Flooding, and Tornados	Barton and Pawnee	$12,845,892
1366	4/27/2001 (4/21/2001)	**Severe Storms** and Tornado	Barton	$4,730,957

Source: FEMA
-: Data unavailable

The following provides details concerning Presidential Disaster Declarations DR 4230 for Kansas Region E. FEMA summary writeups concerning declarations DR-4449, DR-4417 and DR-4403 were unavailable.

Kansas – Severe Storms, Tornados, Straight-Line Winds, and Flooding
FEMA-4230-DR
Declared July 20, 2015

On July 1, 2015, Governor Sam Brownback requested a major disaster declaration due to severe storms, tornados, straight-line winds, and flooding during the period of May 4 to June 21, 2015. The Governor requested a declaration for Public Assistance, including direct federal assistance for 42 counties and Hazard Mitigation statewide. During the period of May 4 to June 27, 2015, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On July 20, 2015, President Obama declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, tornados, straight-line winds, and flooding in Atchison, Barton, Brown, Barber, Chase, Chautauqua, Cherokee, Cheyenne, Clay, Cloud, Barton, Barton, Doniphan, Edwards, Elk, Ellsworth, Comanche, Gray, Greenwood, Comanche, Haskell, Hodgeman, Jackson, Jefferson, Jewell, Lyon, Pratt, Marshall, Pawnee, Meade, Kiowa, Morris, Nemaha, Neosho, Pawnee, Pottawatomie, Republic, Rice, Stevens, Sumner, Wabaunsee, and Washington Counties. Direct Federal assistance was also authorized. Finally, this declaration made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified hailstorm events and the resulting damage totals in Kansas Region E for the period 2009 - 2018 (with 2009 and 2018 being full data set years).

Table 4.99: Kansas Region E NCEI Hailstorm Events, 2009 - 2018

County	Number of Days with Events	Property Damage	Deaths	Injuries
Barber	51	$0	0	0
Barton	54	$6,000	0	0
Comanche	49	$0	0	0
Edwards	33	$0	0	0
Kiowa	53	$0	0	0
Pawnee	56	$0	0	0
Pratt	48	$0	0	0
Stafford	50	$0	0	0

Source: NOAA NCEI

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of hail on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates 585 hail related claims on 225,198 acres for $23,691,906.

Table 4.100: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Hail

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	46	18,801	$1,534,143
Barton	117	30,591	$3,087,443
Comanche	14	4,872	$327,743
Edwards	90	37,527	$3,710,383
Kiowa	69	32,429	$3,782,373
Pawnee	98	36,138	$3,926,936
Pratt	61	25,981	$3,276,975
Stafford	90	38,859	$4,045,910

Source: USDA Farm Service Agency

4.12.3 – Hazard Probability Analysis

The following table summarizes hailstorm probability data for **Barber County**.

Table 4.101: Barber County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	51
Average Events per Year	5
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	46
Average Number of Claims per Year	5
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	18,801
Average Number of Acres Damaged per Year	1,880
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$1,534,143
Average Crop Damage per Year	$153,414

Source: NCEI and USDA

Data from the NCEI indicates that Barber County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to hail occurrences:

- Five insurance claims
- 1,880 acres impacted
- $153,414 in insurance claims

The following table summarizes hailstorm probability data for **Barton County**.

Table 4.102: Barton County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	
Average Events per Year	
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$6,000
Average Property Damage per Year	$600
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	117
Average Number of Claims per Year	12
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	30,591

Table 4.102: Barton County Hailstorm Probability Summary

Data	Recorded Impact
Average Number of Acres Damaged per Year	3,059
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,087,443
Average Crop Damage per Year	$308,744

Source: NCEI and USDA

Data from the NCEI indicates that Barton County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $600 in property damages

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to hail occurrences:

- 12 insurance claims
- 3,059 acres impacted
- $308,744 in insurance claims

The following table summarizes hailstorm probability data for **Comanche County**.

Table 4.103: Comanche County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	
Average Events per Year	
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	14
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	4,872
Average Number of Acres Damaged per Year	487
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$327,743
Average Crop Damage per Year	$32,774

Source: NCEI and USDA

Data from the NCEI indicates that Comanche County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to hail occurrences:

- One insurance claim
- 487 acres impacted
- $32,774 in insurance claims

The following table summarizes hailstorm probability data for **Edwards County**.

Table 4.104: Edwards County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	
Average Events per Year	
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	90
Average Number of Claims per Year	9
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	37,527
Average Number of Acres Damaged per Year	3,753
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,710,383
Average Crop Damage per Year	$371,038

Source: NCEI and USDA

Data from the NCEI indicates that Edwards County can expect on a yearly basis, relevant to hail events:

- Three events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to hail occurrences:

- Nine insurance claims
- 3,753 acres impacted
- $371,038 in insurance claims

The following table summarizes hailstorm probability data for **Kiowa County**.

Table 4.105: Kiowa County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	
Average Events per Year	
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	69

Table 4.105: Kiowa County Hailstorm Probability Summary

Data	Recorded Impact
Average Number of Claims per Year	7
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	32,429
Average Number of Acres Damaged per Year	3,243
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,782,373
Average Crop Damage per Year	$378,237

Source: NCEI and USDA

Data from the NCEI indicates that Kiowa County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to hail occurrences:

- Seven insurance claims
- 3,243 acres impacted
- $378,237 in insurance claims

The following table summarizes hailstorm probability data for **Pawnee County**.

Table 4.106: Pawnee County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	
Average Events per Year	
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	98
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	36,138
Average Number of Acres Damaged per Year	3,614
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,926,936
Average Crop Damage per Year	$392,694

Source: NCEI and USDA

Data from the NCEI indicates that Pawnee County can expect on a yearly basis, relevant to hail events:

- Six events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to hail occurrences:

- Ten insurance claims
- 3,614 acres impacted
- $392,694 in insurance claims

The following table summarizes hailstorm probability data for **Pratt County**.

Table 4.107: Pratt County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	
Average Events per Year	
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	61
Average Number of Claims per Year	6
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	25,981
Average Number of Acres Damaged per Year	2,598
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,276,975
Average Crop Damage per Year	$327,697

Source: NCEI and USDA

Data from the NCEI indicates that Pratt County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to hail occurrences:

- Six insurance claims
- 2,598 acres impacted
- $327,697 in insurance claims

The following table summarizes hailstorm probability data for **Stafford County**.

Table 4.108: Stafford County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	
Average Events per Year	
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Event and Death or Injury	0

Table 4.108: Stafford County Hailstorm Probability Summary

Data	Recorded Impact
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	90
Average Number of Claims per Year	9
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	38,859
Average Number of Acres Damaged per Year	3,886
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$4,045,910
Average Crop Damage per Year	$404,591

Source: NCEI and USDA

Data from the NCEI indicates that Stafford County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to hail occurrences:

- Nine insurance claims
- 3,886 acres impacted
- $404,591 in insurance claims

In addition, Kansas Region E has had 14 Presidentially Declared Disasters relating to severe storms (of which hail is a potential component) in the last 20 years. This represents an average of one declared severe storm disaster per year.

4.14.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to hailstorm events. Counties with a higher or increasing structural inventory, or having a high structural valuation are to be considered to have a potentially greater vulnerability. Additionally, population vulnerabilities to hail events are expected to be minimal.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region E county incurring damage over the period 2009 to 2018 from hailstorm events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

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Table 4.109: Kansas Region E Structural Vulnerability Data for Hailstorms, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Barber	$610,311,000	$0	0.0%
Barton	$3,331,357,000	$6,000	0.0%

Table 4.109: Kansas Region E Structural Vulnerability Data for Hailstorms, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Comanche	$222,342,000	$0	0.0%
Edwards	$408,386,000	$0	0.0%
Kiowa	$320,917,000	$0	0.0%
Pawnee	$794,977,000	$0	0.0%
Pratt	$1,209,374,000	$0	0.0%
Stafford	$515,938,000	$0	0.0%

Source: NCEI and HAZUS

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of hailstorm conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to hailstorm events.

Table 4.110: Hailstorm Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	1,880	0.30%	$93,568,000	$153,414	0.16%
Barton	557,961	3,059	0.55%	$365,672,000	$308,744	0.08%
Comanche	453,556	487	0.11%	$51,803,000	$32,774	0.06%
Edwards	392,025	3,753	0.96%	$228,780,000	$371,038	0.16%
Kiowa	442,981	3,243	0.73%	$78,281,000	$378,237	0.48%
Pawnee	474,275	3,614	0.76%	$362,349,000	$392,694	0.11%
Pratt	465,191	2,598	0.56%	$271,307,000	$327,697	0.12%
Stafford	493,694	3,886	0.79%	$198,573,000	$404,591	0.20%

Source: USDA

4.14.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.111: Hailstorm Consequence Analysis

Subject	Impacts of Hailstorm
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the areas of hail are expected to be severe if caught without proper shelter.
Health and Safety of Responders	Impacts will be predicated on the severity of the event. Damaged infrastructure will likely result in hazards such as downed utility lines, main breakages and debris on roadways. .
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage. Services may be limited to essential tasks if utilities are impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location and structural capacity of the facility. Loss of structural integrity of buildings and infrastructure could occur. Utility lines, roads, residential and business properties will be affected.

Table 4.111: Hailstorm Consequence Analysis

Subject	Impacts of Hailstorm
Environment	Impact could be severe for the immediate impacted area, depending on the size of the event. Impact will lessen as distance increases from the immediate incident area
Economic Conditions	Impacts to the economy will be dependent severity of the event and the impact on structures and infrastructure. Impacts could be severe if roads/utilities are affected.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Warning systems in place and the timeliness of those warnings could be questioned.

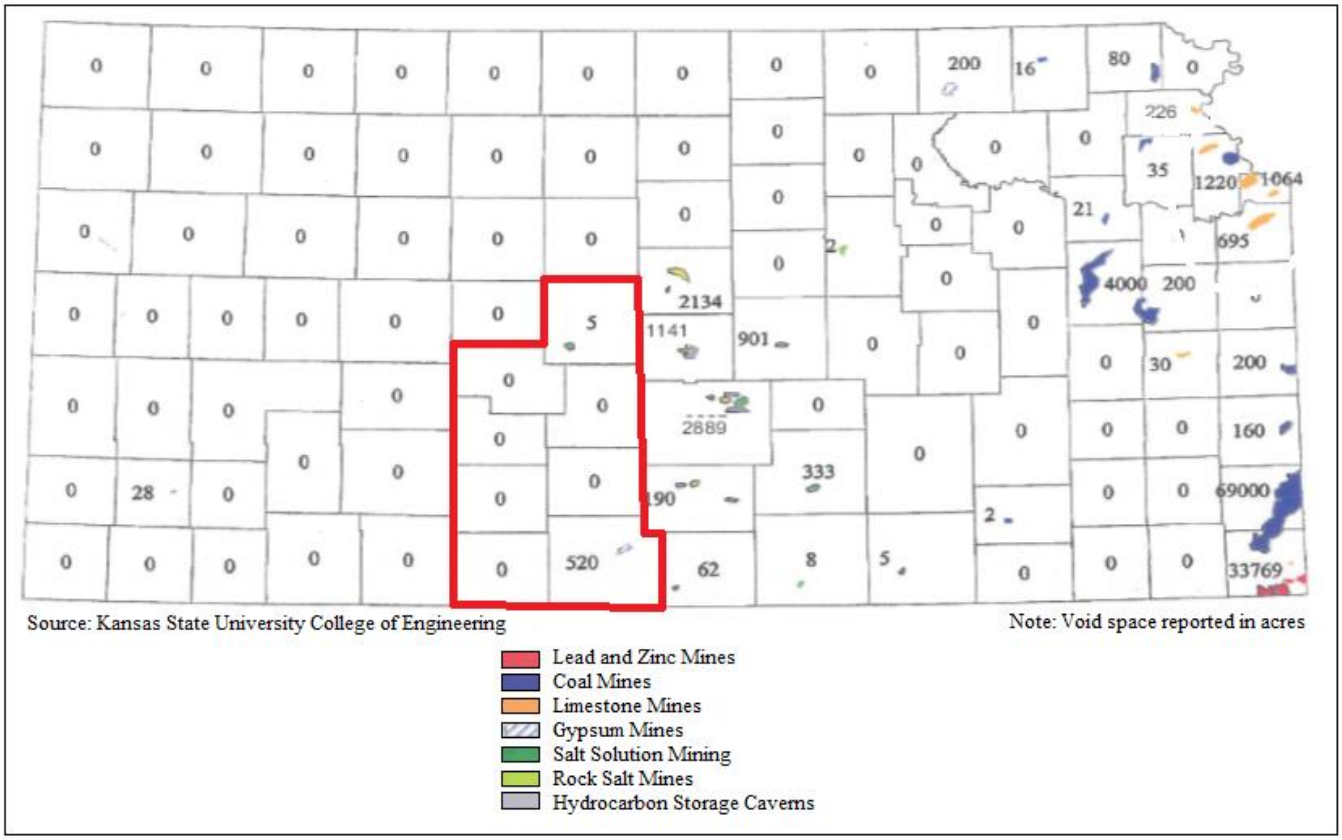
4.15 – Land Subsidence

Land subsidence is caused when the ground above manmade or natural voids collapses. Subsidence can be related to mine collapse, water and oil withdrawal, or natural causes such as shrinking of expansive soils, salt dissolution (which may also be related to mining activities), and cave collapses. The surface depression is known as a sinkhole. If sinkholes appear beneath developed areas, damage or destruction of buildings, roads and rails, or other infrastructure can result. The rate of subsidence, which ranges from gradual to catastrophic, correlates to its risk to public safety and property damage.

4.15.1 – Location and Extent

The Kansas Department of Health and Environment (KDHE) prepared a report on "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas." The report inventoried subsurface void space from oil and gas exploration and production, natural sources, shaft mining, and solution mining. The following map details the distribution of total acres and major cause of void spaces for all Kansas Region E counties.

KDHE Total Subsurface Void Space



The following table details the total amount of subsurface void space as calculated using data from the KDHE map.

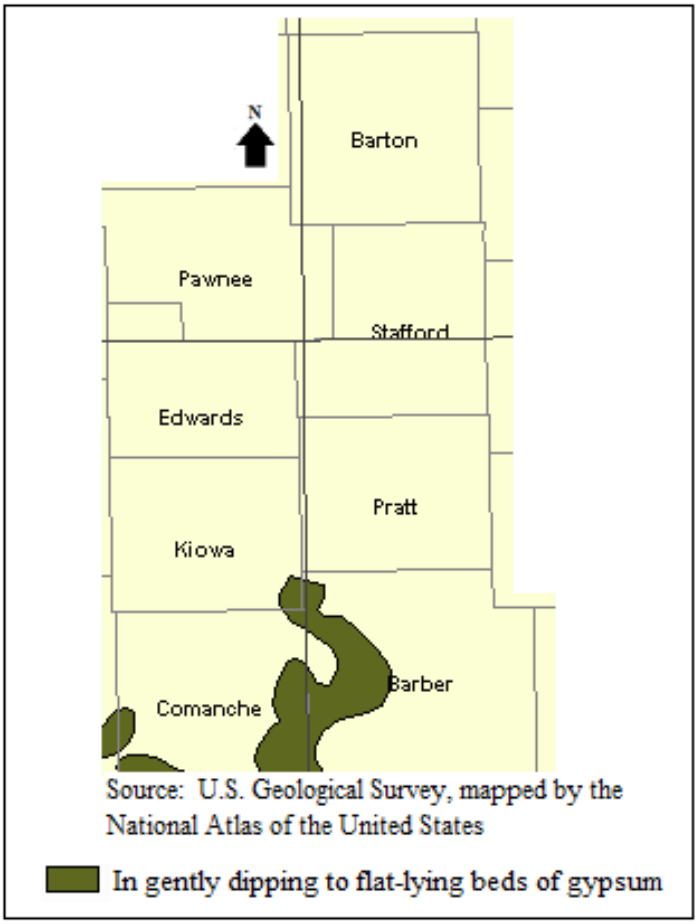
Table 4.112: Kansas Region E Sub-Surface Void Space

County	Total Sub-Surface Void Space (acres)
Barber	520
Barton	5
Comanche	0
Edwards	0
Kiowa	0
Pawnee	0
Pratt	0
Stafford	0

Source: KDHE

Of additional concern to Kansas Region E is Karst topography. The following map from the United States Geologic Survey (USGS) indicates areas of Karst topography in the region. There are limited documented problems associated with natural limestone subsidence and sinkholes in Kansas Region E.

USGS Karst Topography



4.15.2 – Previous Occurrences

There have been no reported land subsidence events in Kansas Region E during the ten-year period from 2009 to 2018.

4.15.3 – Hazard Probability Analysis

Land subsidence events with the potential to affect Kansas Region E are incredibly difficult to quantify and forecast. Compounding the difficulty, land subsidence events occur on their own or occur as a secondary hazard with incidents of heavy rain, melting snow, and earthquakes as a primary cause. Hence, their future occurrences are highly dependent on the likelihood of the mentioned hazards.

Based on limited available data, indicating that there have been no reported events in the past ten years, and bearing in mind that many events may be unreported as they have no impact on human activities, the probability of a reported land subsidence occurrence in any given year is very low.

4.15.4 Vulnerability Analysis

Counties with a higher or increasing population, high, or increasing, or having a high structural valuation are to be considered to have a potentially greater vulnerability. Additionally, population vulnerabilities to land subsidence events are expected to be minimal.

Vulnerability to land subsidence in Kansas Region E was analyzed using the KDHE "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas" report. All documented acres of subsurface void space were classified according to these risk categories for each of the following causes of void space:

- Lead and Zinc Mines
- Coal Mines
- Limestone Mines
- Gypsum Mines
- Salt Solution Mining
- Rock Salt Mines
- Hydrocarbon Storage Caverns

Based on these classifications, a risk category was assigned to each of the subsurface void acres:

- Category I: High Risk
- Category II: Medium Risk
- Category III: Low Risk

The following table shows the classification of the void space in each of Kansas Region E counties. Please note that not all classifications with identified acreage are shown.

Table 4.113: Kansas Region E Sub-Surface Void Space Risk Classification in Acres

County	Gypsum Category II	Salt Solution Category I	Total Sub-Surface Void Space
Barber	520	0	520
Barton	0	5	5
Comanche	0	0	0
Edwards	0	0	0
Kiowa	0	0	0
Pawnee	0	0	0
Pratt	0	0	0
Stafford	0	0	0

Source: KDHE, "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas" 2006.

Based on this data, the area for each county underlain by sub-surface void acreage was determined. The higher percentage of acreage underlain by void area the higher the potential vulnerability.

Table 4.114: Kansas Region E Percentage of Land Underlain by Sub-Surface Void Space

County	Total County Acreage	Sub-Surface Void Space Acreage	Percentage of County Acreage Underlain by Void Space
Barber	727,040	520	0.07%
Barton	576,000	5	0.00%
Comanche	505,600	0	0.00%
Edwards	398,080	0	0.00%
Kiowa	462,720	0	0.00%
Pawnee	483,200	0	0.00%
Pratt	471,040	0	0.00%
Stafford	508,800	0	0.00%

Source: KDHE

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region E county incurring damage over the period 2009 to 2018 from land subsidence events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

Table 4.115: Kansas Region E Structural Vulnerability Data for Land Subsidence, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Barber	$610,311,000	$0	0.0%
Barton	$3,331,357,000	$0	0.0%
Comanche	$222,342,000	$0	0.0%
Edwards	$408,386,000	$0	0.0%
Kiowa	$320,917,000	$0	0.0%
Pawnee	$794,977,000	$0	0.0%

Table 4.115: Kansas Region E Structural Vulnerability Data for Land Subsidence, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Pratt	$1,209,374,000	$0	0.0%
Stafford	$515,938,000	$0	0.0%

Source: NCEI and HAZUS

4.15.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.116: Land Subsidence Consequence Analysis

Subject	Impacts of Land Subsidence
Health and Safety of the Public	Local impact expected to be moderate to severe for the incident area, depending on the scale of the area.
Health and Safety of Responders	Impact to responders would be minimal.
Continuity of Operations	Minimal expectation of execution of the COOP, unless a facility is impacted.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the incident area has the potential to do severe damage.
Environment	Impact to the area would be minimal.
Economic Conditions	Impacts to the economy will depend on the severity of the damage.
Public Confidence in the Jurisdiction's Governance	Local development policies will be questioned

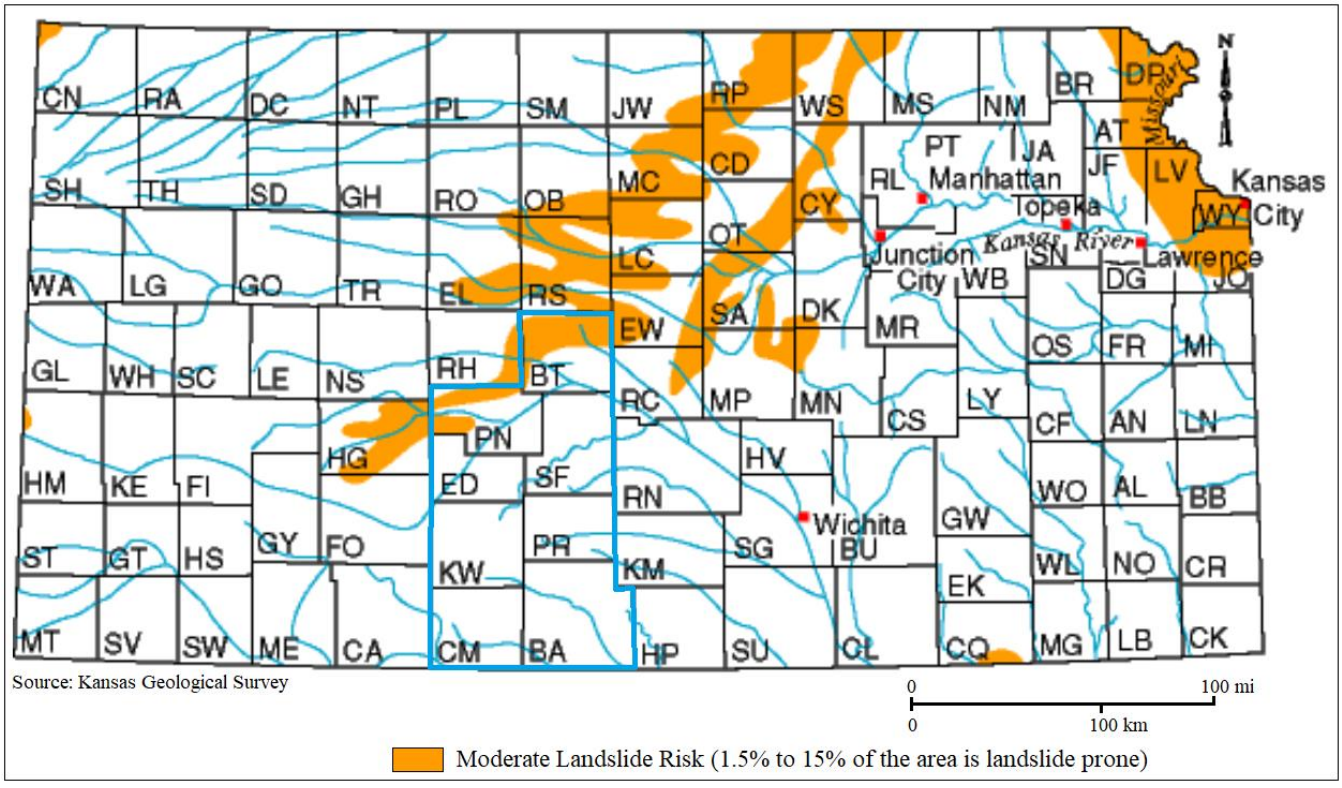
4.16 – Landslides

Landslides are the downward and outward movement of slopes. Landslides include a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on and over steepened slopes is the primary reason for a landslide, landslides are often prompted by the occurrence of other disasters. Other contributing factors include erosion, steep slopes, rain and snow, and earthquakes.

4.16.1 – Location and Extent

Landslides are classified based mostly on their character of movement and degree of internal disruption. These landslide classes are rock fall, flow, slide, and creep. Although these are clear divisions, in the real world a landslide may have components of more than one type. Areas prone to landslides can cover broad geographic regions, but occurrences are generally localized. The entire planning area, including all participating jurisdictions, is potentially at risk to landslides. However, landslides require an earth or rock covered slope, and so flatter areas have a much-decreased risk of occurrence. The following map, produced by the Kansas Geological Survey (KGS), shows areas of the region with a moderate susceptibility of landslides, equating to 1.5% to 15% of the area being landslide prone.

KGS Regional Landslide Map



4.16.2 – Previous Occurrences

At present there is no centralized and complete database containing historical records for landslides in Kansas.

In the 20-year period from 1999 to present, there has been one Presidential Disaster Declaration for Kansas Region E for landslides and mudslides (along with other associates hazard event). DR 4449 was declared on June 20, 2019 for Severe Storms, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides. A FEMA summary writeup concerning declaration DR-4449 was unavailable. However, information solicited from MPC members indicate that no damaging landslides or mudslides were recorded within the region for this event. For Kansas Region E there have been no other reported or recorded landslides impacting either participating jurisdictions or the region in the past 10 years.

4.16.3 – Hazard Probability Analysis

Landslides with the potential to affect Kansas Region E are incredibly difficult to quantify and forecast. Compounding the difficulty, landslides occur on their own or occur as a secondary hazard with incidents of heavy rain, melting snow, earthquakes, and land subsidence are their primary cause. Hence, their future occurrences are highly dependent on the likelihood of the mentioned hazards.

As indicated in the map above, no areas of Kansas Region E have been identified as having a moderate susceptibility to landslides. Additionally, the limited available past occurrence data indicate that there is a very low rate of occurrence. Based on limited available data, and bearing in mind that many landslides may be unreported as they have no impact on human activities, it is not likely that a major landslide will impact the region based on zero reported occurrences in 10 years.

4.16.4 Vulnerability Analysis

Based on landslide mapping by the KGS, the area for each county with a moderate landslide risk was estimated. The higher percentage of acreage in a moderate landslide risk area the higher the potential vulnerability. However, landslides require an earth or rock covered slope, and so flatter areas have a much-decreased risk of occurrence.

Table 4.117: Kansas Region E Percentage of Land in Moderate Landslide Risk Area

County	Total County Acreage	Estimated Acreage with Moderate Landslide Potential	Percentage of County Acreage Identified in Potential Slide Area
Barber	727,040	0	0.00%
Barton	576,000	230,400	40.00%
Comanche	505,600	0	0.00%
Edwards	398,080	0	0.00%
Kiowa	462,720	0	0.00%
Pawnee	483,200	96,640	20.00%
Pratt	471,040	0	0.00%
Stafford	508,800	0	0.00%

Source: KDEM and HAZUS

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region E county incurring damage over the period 2009 to 2018 from landslide events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

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Table 4.118: Kansas Region E Structural Vulnerability Data for Landslides, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Barber	$610,311,000	$0	0.0%
Barton	$3,331,357,000	$0	0.0%
Comanche	$222,342,000	$0	0.0%
Edwards	$408,386,000	$0	0.0%
Kiowa	$320,917,000	$0	0.0%
Pawnee	$794,977,000	$0	0.0%
Pratt	$1,209,374,000	$0	0.0%
Stafford	$515,938,000	$0	0.0%

Source: NCEI and HAZUS

Population vulnerabilities to landslide events are expected to be minimal.

4.16.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.119: Landslide Consequence Analysis

Subject	Impacts of Landslide
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the path of the slide are expected to be severe.
Health and Safety of Responders	Impacts are expected to be minimal.
Continuity of Operations	Minimal expectation of execution of the COOP, unless a facility is impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location of the facility in relation to the slide. Loss of structural integrity of buildings and infrastructure could occur.
Environment	Impact to the area would be minimal other than the immediate area.
Economic Conditions	Impacts to the economy will be dependent severity of landslide and the impact on structures and infrastructure. Impacts could be severe if roads/utilities are affected. Otherwise impact would be non-existent to minimal.
Public Confidence in the Jurisdiction's Governance	Confidence could be an issue if local development policies are questioned.

4.17 – Lightning

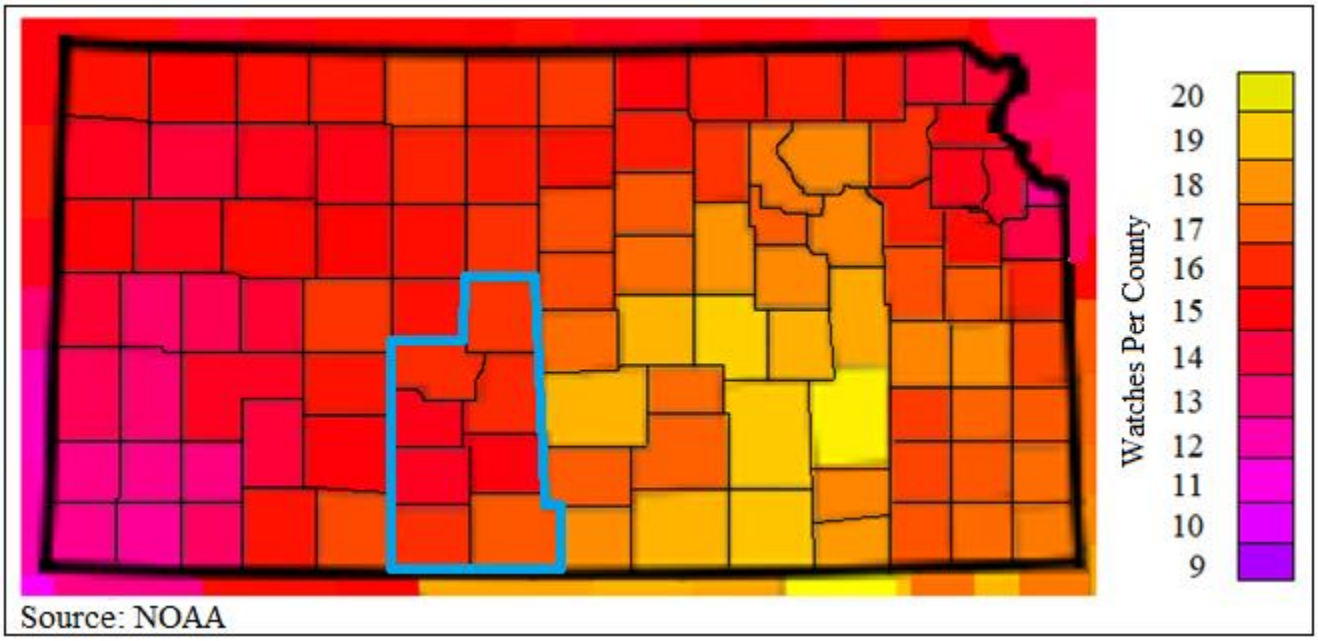
Lightning is a discharge of atmospheric electricity that is triggered by a buildup of differing charges within a cloud. According to the NWS, lightning is one of the most underrated severe weather hazards and is the second deadliest weather killer in the United States.

4.17.1 – Location and Extent

Lightning occurs over broad geographic regions. The entire Kansas Region E planning area, including all participating jurisdictions, is at risk to lightning.

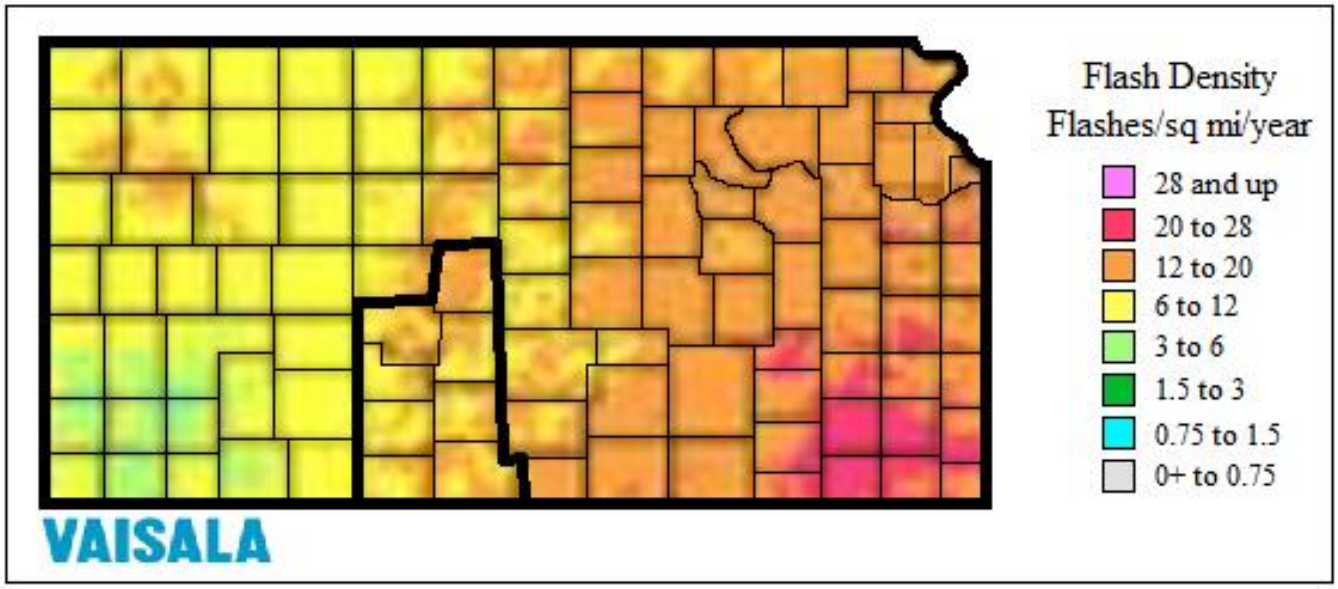
Thunderstorms are often the generator of lightning. The following map, generated by NOAA, indicates the average number severe thunderstorm watches per year for Kansas Region E.

Annual Average Thunderstorm Watches per Year (20-Year Average, 1993-2012)



The following map, generated by Vaisala, indicates the average number of lightning flashes per square mile per year for Kansas Region E. In general, the more recorded flashes the greater the potential for lightning strikes.

Vaisala Lightning Flash Density, 2008-2017



4.17.2 – Previous Occurrences

In the 20-year period from 1999 to present, there have been 14 Presidential Disaster Declarations for Kansas Region E for severe storms (along with other associates hazard event), of which lightning may be a component. The following 20-year information (with 1999 and 2018 being full data years) on past declared disasters is presented to provide a historical perspective on lightning events that have impacted Kansas Region E. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2014.

Table 4.120: Kansas Region E FEMA Severe Storm Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28/2019 – 07/12/2019)	**Severe Storms**, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Pawnee, and Pratt	$590,356
4417	02/25/2019 (10/04-10/15/2018)	**Severe Storms**, Straight-line Winds, And Flooding	Barber, Barton, and Pratt	$445,154
4403	10/19/2018 (09/01-09/08/2019)	**Severe Storms**, Straight-line Winds, And Flooding	Barber, Kiowa, And Pratt	$1,343,151
4230	07/20/2015 (05/04/2015 – 06/21/2015)	**Severe Storms**, Tornados, Straight-line Winds, and Flooding	Barton and Edwards	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	**Severe Storms**, Straight-line Winds, Tornados, and Flooding	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Kiowa, Pawnee, and Pratt	$11,412,827

Table 4.120: Kansas Region E FEMA Severe Storm Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4063	05/24/2012 (4/14-4/15/2012)	**Severe Storms**, Tornados, Straight-line Winds and Flooding	Edwards, Kiowa, and Stafford	$6,923,919
4010	07/29/2011 (5/19-6/4/2011)	**Severe Storms**, Straight-line Winds, Tornados and Flooding	Barton and Stafford	$8,259,620
1932	08/10/2010 (6/7-7/21/2010)	**Severe Storm**s, Flooding and Tornados	Comanche, Kiowa, and Pawnee	$9,279,257
1849	06/25/2009 (4/25-5/16/2009)	**Severe Storms**, Flooding, Straight-line Winds, and Tornados	Barber	$15,013,488
1776	07/09/2008	**Severe Storms**, Flooding, and Tornados	Barber, Barton, Comanche, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$70,629,544
1711	7/2/2007 (6/26-30/2007)	**Severe Storms** and Flooding	Edwards and Pawnee	$40,238,600
1699	5/6/2007 (5/4/2007)	**Severe Storms**, Tornados, and Flooding	Barton, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$117,565,269
1535	8/3/2004 (6/12-7/25/2004)	**Severe Storms**, Flooding, and Tornados	Barton and Pawnee	$12,845,892
1366	4/27/2001 (4/21/2001)	**Severe Storms** and Tornado	Barton	$4,730,957

Source: FEMA
-: Data unavailable

The following provides details concerning Presidential Disaster Declarations DR 4230 for Kansas Region E. FEMA summary writeups concerning declarations DR-4449, DR-4417 and DR-4403 were unavailable.

Kansas – Severe Storms, Tornados, Straight-Line Winds, and Flooding
FEMA-4230-DR
Declared July 20, 2015

On July 1, 2015, Governor Sam Brownback requested a major disaster declaration due to severe storms, tornados, straight-line winds, and flooding during the period of May 4 to June 21, 2015. The Governor requested a declaration for Public Assistance, including direct federal assistance for 42 counties and Hazard Mitigation statewide. During the period of May 4 to June 27, 2015, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On July 20, 2015, President Obama declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms,

tornados, straight-line winds, and flooding in Atchison, Barton, Brown, Barber, Chase, Chautauqua, Cherokee, Cheyenne, Clay, Cloud, Barton, Barton, Doniphan, Edwards, Elk, Ellsworth, Comanche, Gray, Greenwood, Comanche, Haskell, Hodgeman, Jackson, Jefferson, Jewell, Lyon, Pratt, Marshall, Pawnee, Meade, Kiowa, Morris, Nemaha, Neosho, Pawnee, Pottawatomie, Republic, Rice, Stevens, Sumner, Wabaunsee, and Washington Counties. Direct Federal assistance was also authorized. Finally, this declaration made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified lightning events and the resulting damage totals in Kansas Region E from the period 2009 - 2018.

Table 4.121: Kansas Region E NCEI Lightning Events, 2009 - 2018

County	Number of Events	Property Damage	Deaths	Injuries
Barber	1	$0	0	1
Barton	2	$20,000	0	0
Comanche	0	$0	0	0
Edwards	0	$0	0	0
Kiowa	0	$0	0	0
Pawnee	0	$0	0	0
Pratt	0	$0	0	0
Stafford	0	$0	0	0

Source: NOAA NCEI

The following local events were reported.

- **July 27, 2009**: **Barber County**
  A 14-year-old male was struck and severely injured by a lightning bolt. He was going outside where some tents were pitch. CPR had to be performed as he had not pulse or respiration when rescuers reached him. Miraculously he made a full recovery after about 2 weeks in the hospital.

- **May 24, 2011**: **Barton County**
  A small fire at a Great Bend apartment complex was reportedly started by lightning. Property damages were reported at $15,000.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of lightning on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates no related claims.

Table 4.122: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Lightning

County	USDA Crop Loss	Acres Impacted	Number of Claims
Barber	$0	0	0
Barton	$0	0	0
Comanche	$0	0	0
Edwards	$0	0	0
Kiowa	$0	0	0

Table 4.122: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Lightning

County	USDA Crop Loss	Acres Impacted	Number of Claims
Pawnee	$0	0	0
Pratt	$0	0	0
Stafford	$0	0	0

Source: USDA

4.17.3 – Hazard Probability Analysis

Data from the NCEI indicates that Region E counties can expect on a yearly basis, relevant to lightning events:

- No deaths
- <1 injuries
- $2,000 in reported property damages

According to the USDA Risk Management Agency, Region E counties can expect on a yearly basis, relevant to lightning occurrences:

- No claims
- No impacted acres
- $0 in damages

In addition, Kansas Region E has had 14 Presidentially Declared Disasters relating to severe storms (of which lightning is a potential component) in the last 20 years. This represents an average of one declared severe storm disaster per year.

4.17.4 – Vulnerability Analysis

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region E county incurring damage over the period 2009 to 2018 from lightning events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

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Table 4.123: Kansas Region E Structural Vulnerability Data for Lightning, 2009 -2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Barber	$610,311,000	$0	0.0%
Barton	$3,331,357,000	$0	0.0%
Comanche	$222,342,000	$0	0.0%
Edwards	$408,386,000	$0	0.0%
Kiowa	$320,917,000	$0	0.0%
Pawnee	$794,977,000	$0	0.0%
Pratt	$1,209,374,000	$0	0.0%
Stafford	$515,938,000	$0	0.0%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to lightning events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.124: Kansas Region E Population Vulnerability Data for Lightning

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

In addition, lightning may exacerbate agricultural and economic losses. The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data (2014 – 2018) allows us to quantify the monetary impact of lightning strikes on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to lightning events.

Table 4.125: Lightning Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	0	0.0%	$93,568,000	0	0.0%
Barton	557,961	0	0.0%	$365,672,000	0	0.0%
Comanche	453,556	0	0.0%	$51,803,000	0	0.0%
Edwards	392,025	0	0.0%	$228,780, 000	0	0.0%
Kiowa	442,981	0	0.0%	$78,281,000	0	0.0%
Pawnee	474,275	0	0.0%	$362,349,000	0	0.0%
Pratt	465,191	0	0.0%	$271,307,000	0	0.0%
Stafford	493,694	0	0.0%	$198,573,000	0	0.0%

Source: USDA

4.17.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.126: Lightning Consequence Analysis

Subject	Impacts of Lightning
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the areas of lightning are expected to be severe if caught without proper shelter.
Health and Safety of Responders	Impacts will be predicated on the severity of the event. Damaged infrastructure will likely result in hazards such as downed utility lines, main breakages and debris on roadways.
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage. Services may be limited to essential tasks if utilities are impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location and structural capacity of the facility. Loss of utility infrastructure could occur. Utility lines, residential and business properties will be affected.
Environment	Impact could be severe for the immediate impacted area, depending on the size of the event. Impact will lessen as distance increases from the immediate incident area
Economic Conditions	Impacts to the economy will be dependent severity of the event and the impact on structures and infrastructure. Impacts could be severe if utilities are affected.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Warning systems in place and the timeliness of those warnings could be questioned.

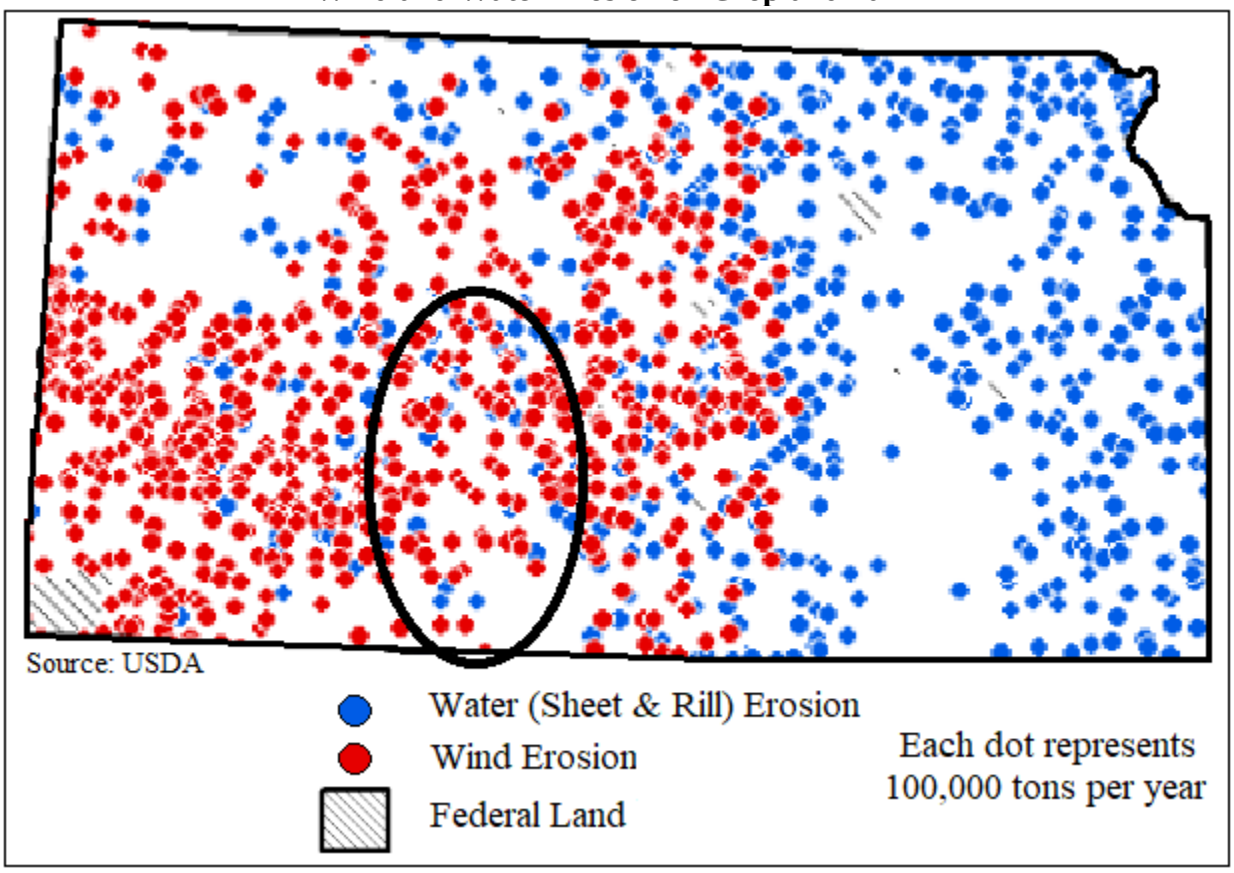
4.18 – Soil Erosion and Dust

Soil erosion, in general, is a process that removes topsoil through the application of water, wind, or farming activities. Soil erosion can be a slow, unobserved process or can happen quickly due to extreme environmental factors. The United States is losing soil 10 times faster than the natural replenishment rate, and related production losses cost the country about $44,000,000,000 each year. On average, wind erosion is responsible for about 40% of this loss and can increase markedly in drought years.

4.18.1 – Location and Extent

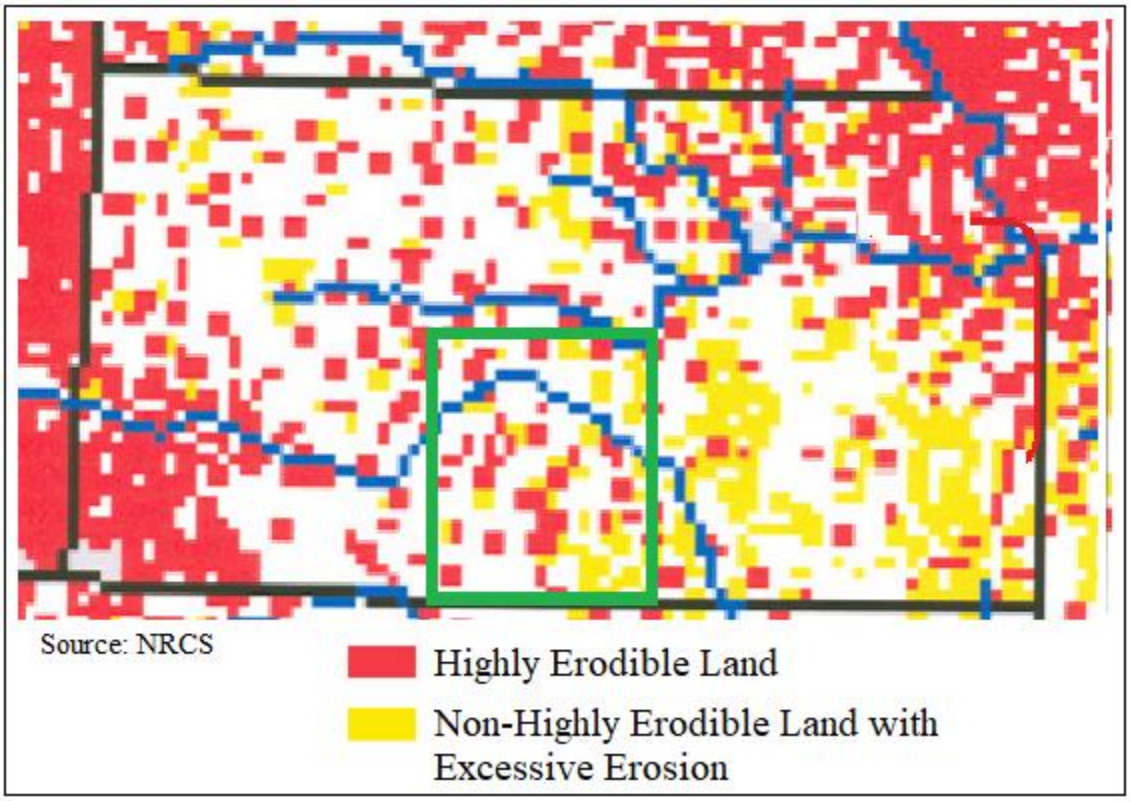
Soil erosion and dust occurs over broad geographic regions. The entire Kansas Region E planning area, including all participating jurisdictions, is at risk to soil erosion and dust.

Wind and Water Erosion on Cropland 2012



The following figure, from the Natural Resources Conservation Service (NRCS) shows areas of excessive erosion of farmland in Kansas. Each red dot represents 5,000 acres of highly erodible land, and each yellow dot represents 5,000 acres of non-highly erodible land with excessive erosion above the tolerable soil erosion rate.

NRCS Highly Erodible Land



4.18.2 – Previous Occurrences

At present there is no centralized and complete database containing historical records for soil erosion in Kansas. For Kansas Region E there have been no reported or recorded soil erosion or dust events impacting either participating jurisdictions or the region in the past 10 years.

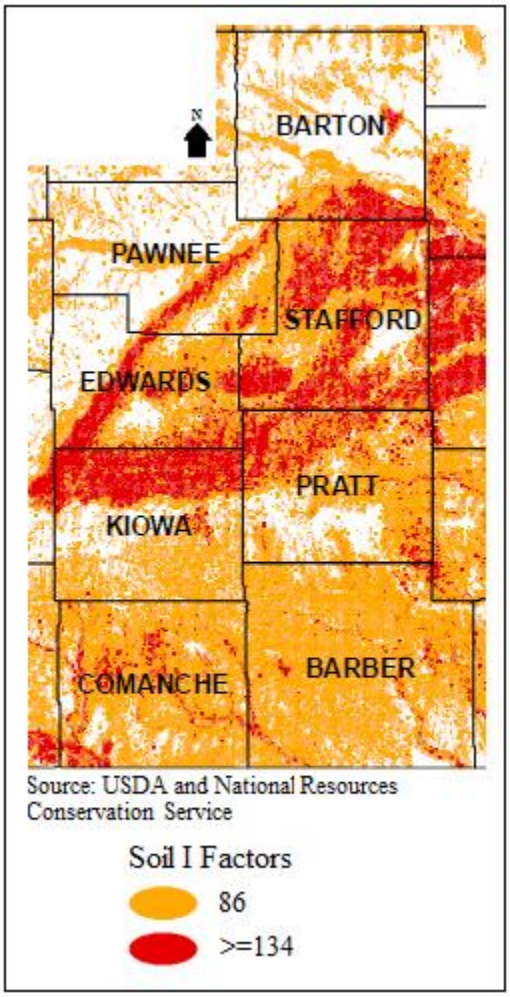
Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of soil erosion and dust on the Region's agricultural base. Crop loss data for the years 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates no related claims

4.18.3 – Hazard Probability Analysis

Predicting future erosion amounts is problematic as much relies on farm management practices, available moisture and crop type. Due to the on-going nature of this hazard, and the small agricultural base for the region, it is expected that future events causing minimally measurable impact to the regions crops and farmers will continue occur. Again, the rate of occurrence and potential future occurrence will be predicated on farm management practices and drought and water conditions.

The map below indicates all Kansas Region E soils that have an "I" value, or wind erodibility index, of 86 or greater. The higher the I value, the more susceptible it is to wind erosion.

Region Soil I Values



4.18.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to soil erosion and dust events. Additionally, as this hazard disproportionately impacts the agricultural sector, only data on that sector was reviewed for potential vulnerability. Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of soil erosion on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates no soil erosion related claims.

Table 4.127: Soil Erosion and Dust Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	0	0.0%	$93,568,000	0	0.0%
Barton	557,961	0	0.0%	$365,672,000	0	0.0%
Comanche	453,556	0	0.0%	$51,803,000	0	0.0%

Table 4.127: Soil Erosion and Dust Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Edwards	392,025	0	0.0%	$228,780, 000	0	0.0%
Kiowa	442,981	0	0.0%	$78,281,000	0	0.0%
Pawnee	474,275	0	0.0%	$362,349,000	0	0.0%
Pratt	465,191	0	0.0%	$271,307,000	0	0.0%
Stafford	493,694	0	0.0%	$198,573,000	0	0.0%

Source: USDA

4.18.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.128: Soil Erosion and Dust Consequence Analysis

Subject	Impacts of Soil Erosion and Dust
Health and Safety of the Public	Impact tends to be agricultural; however, dust can be a danger to susceptible individuals in the form of air pollutants.
Health and Safety of Responders	With proper preparedness and protection, impact to the responders is expected to be minimal.
Continuity of Operations	Minimal expectation for utilization of the COOP.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be severe, depending on the site of the soil erosion. This could adversely affect utility poles/lines, and facilities. Dust can also adversely affect machinery, air conditioners, etc.
Environment	The impact to the environment could be severe. Soil erosion and dust can severely affect farming, ranching, wildlife and plants due to production losses and habitat changes.
Economic Conditions	Impacts to the economy will be dependent on how extreme the soil erosion and dust are. Potentially it could severely affect crop yield and productivity. Seedling survival and growth is stressed by erosion and dust, as is the top soil which agriculture is dependent on.
Public Confidence in the Jurisdiction's Governance	Planning, response, and recovery may be questioned if not timely and effective.

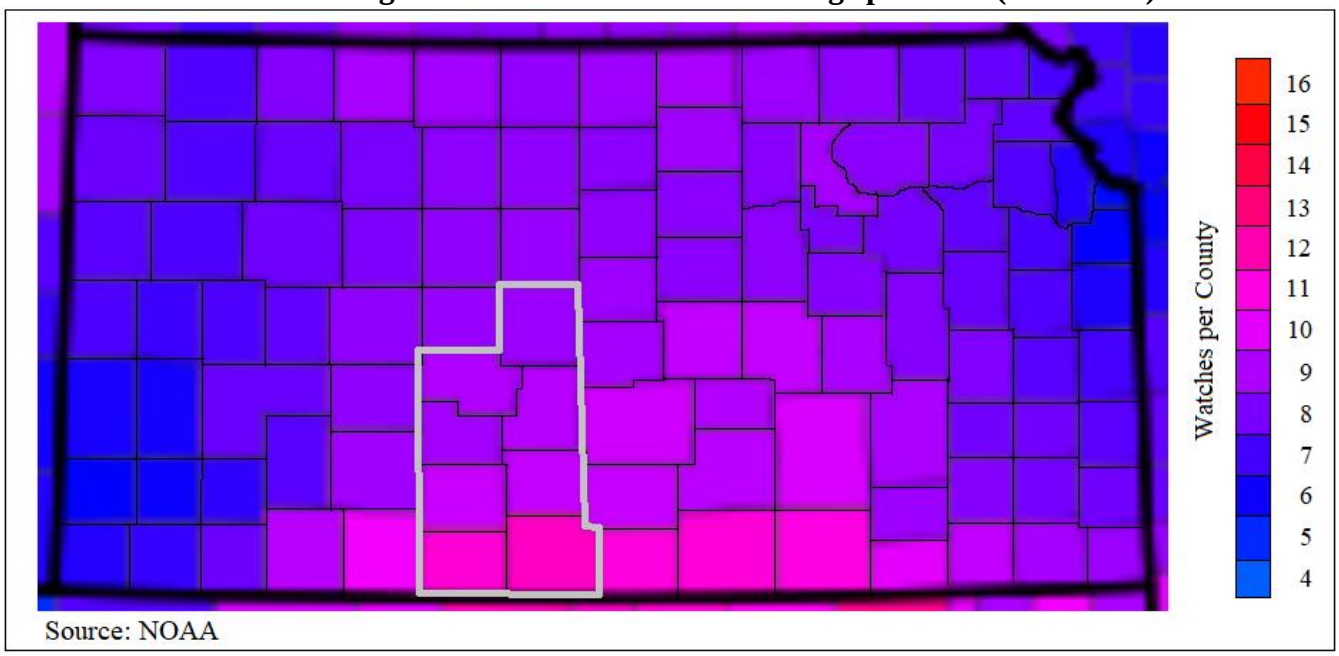
4.19 – Tornado

A tornado is a violently rotating column of air in contact with the ground. Often referred to as a twister or a cyclone, they can strike anywhere and with little warning. Tornados come in many shapes and sizes but are typically in the form of a visible condensation funnel, whose narrow end touches the earth and is often encircled by a cloud of debris and dust.

4.19.1 – Location and Extent

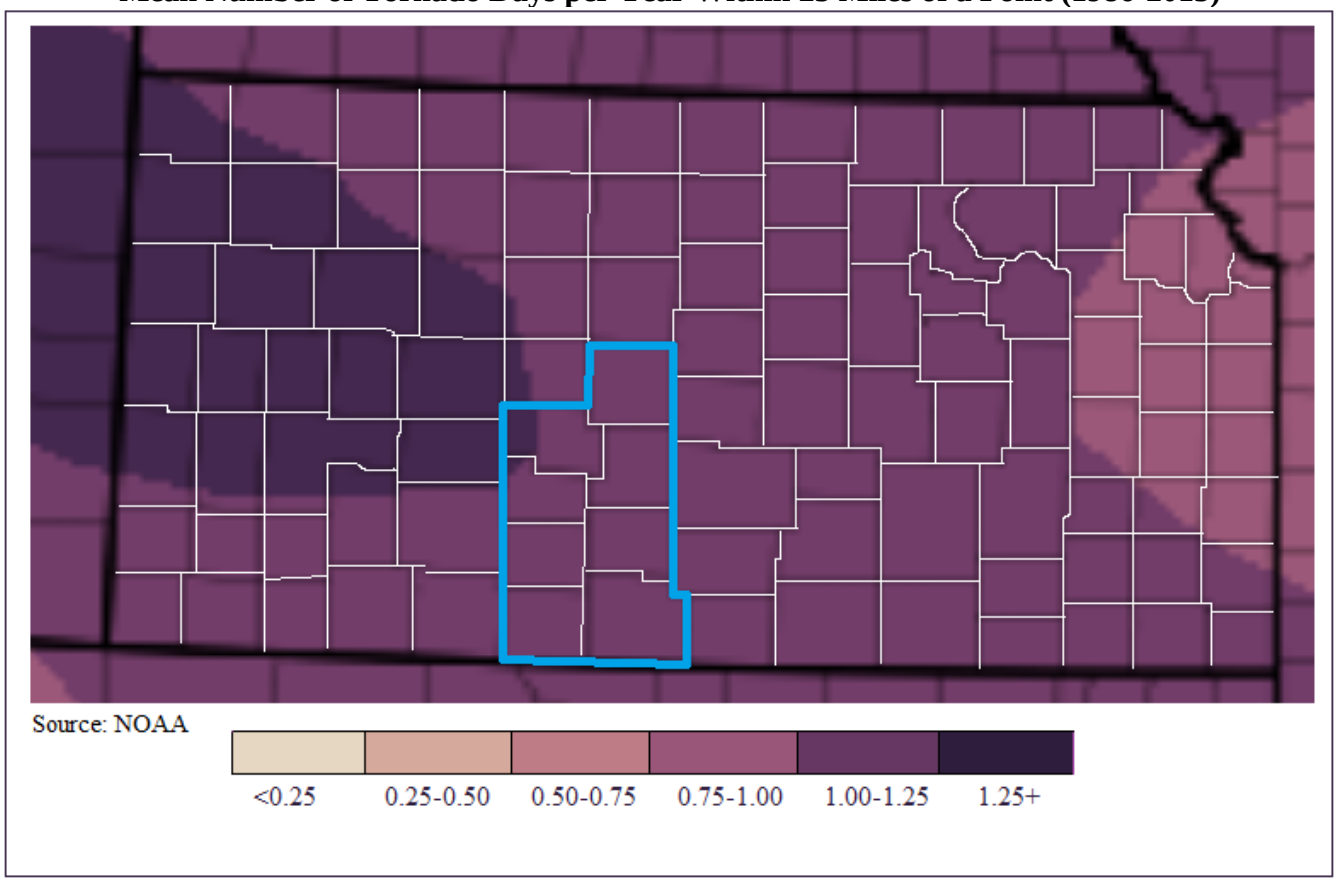
Tornados can strike anywhere in Kansas Region E, placing the entire planning area at risk. The following map, generated by NOAA, shows the average annual tornado watches per year for Kansas Region E.

Annual Average Tornado Watches Year Average per Year (1933-2012)



Additionally, NOAA generated the following map indicating the mean number of tornado days per year, using data compiled from the years 1986 to 2015.

Mean Number of Tornado Days per Year Within 25 Miles of a Point (1986-2015)



Many tornados only exist for a few seconds in the form of a touchdown. The most extreme tornados can attain wind speeds of more than 200 miles per hour, stretch more than two miles across, and travel dozens of miles.

A tornado may arrive with a squall line or cold front and touch down quickly. Smaller tornados can strike without warning. Other times tornado watches and sirens will alert communities of high potential tornado producing weather or an already formed tornado and its likely path.

Since 2007, the United States uses the Enhanced Fujita Scale to categorize tornados. The scale correlates wind speed values per F level and provides a rubric for estimating damage.

Table 4.129: Enhanced Fujita Scale

Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornados with no reported damage (i.e. those that remain in open fields) are always rated EF0.
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.

Table 4.129: Enhanced Fujita Scale

Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF2	111-135	10.7%	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	3.4%	Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	0.7%	Devastating. Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA Storm Prediction Center

4.19.2 – Previous Occurrences

In the 20-year period from 1999 to present, there have been eight Presidential Disaster Declarations for Kansas Region E for tornados (along with other associates hazard event), of which hail may be a component. The following 20-year information (with 1999 and 2018 being full data years) on past declared disasters is presented to provide a historical perspective on tornado events that have impacted Kansas Region E. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2014.

Table 4.130: Kansas Region E FEMA Tornado Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28/2019 – 07/12/2019)	Severe Storms, Straight-line Winds, **Tornados**, Flooding, Landslides, and Mudslides	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Pawnee, and Pratt	$590,356
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, **Tornados**, Straight-line Winds, and Flooding	Barton and Edwards	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, Straight-line Winds, **Tornados**, and Flooding	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Kiowa, Pawnee, and Pratt	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, **Tornados**, Straight-line Winds and Flooding	Edwards, Kiowa, and Stafford	$6,923,919
4010	07/29/2011 (5/19-6/4/2011)	Severe Storms, Straight-line Winds, **Tornados** and Flooding	Barton and Stafford	$8,259,620

Table 4.130: Kansas Region E FEMA Tornado Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
1932	08/10/2010 (6/7-7/21/2010)	Severe Storms, Flooding and **Tornados**	Comanche, Kiowa, and Pawnee	$9,279,257
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, Straight-line Winds, and **Tornados**	Barber	$15,013,488
1776	07/09/2008	Severe Storms, Flooding, and **Tornados**	Barber, Barton, Comanche, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$70,629,544
1699	5/6/2007 (5/4/2007)	Severe Storms, **Tornados**, and Flooding	Barton, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$117,565,269
1535	8/3/2004 (6/12-7/25/2004)	Severe Storms, Flooding, and **Tornados**	Barton and Pawnee	$12,845,892
1366	4/27/2001 (4/21/2001)	Severe Storms and **Tornado**	Barton	$4,730,957

Source: FEMA
-: Data unavailable

The following provides details concerning Presidential Disaster Declarations DR 4230 for Kansas Region E. A FEMA summary writeup concerning declarations DR-4449 was unavailable.

Kansas – Severe Storms, Tornados, Straight-Line Winds, and Flooding
FEMA-4230-DR
Declared July 20, 2015

On July 1, 2015, Governor Sam Brownback requested a major disaster declaration due to severe storms, tornados, straight-line winds, and flooding during the period of May 4 to June 21, 2015. The Governor requested a declaration for Public Assistance, including direct federal assistance for 42 counties and Hazard Mitigation statewide. During the period of May 4 to June 27, 2015, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On July 20, 2015, President Obama declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, tornados, straight-line winds, and flooding in Atchison, Barton, Brown, Barber, Chase, Chautauqua, Cherokee, Cheyenne, Clay, Cloud, Barton, Barton, Doniphan, Edwards, Elk, Ellsworth, Comanche, Gray, Greenwood, Comanche, Haskell, Hodgeman, Jackson, Jefferson, Jewell, Lyon, Pratt, Marshall, Pawnee, Meade, Kiowa, Morris, Nemaha, Neosho, Pawnee, Pottawatomie, Republic, Rice, Stevens, Sumner, Wabaunsee, and Washington Counties. Direct

Federal assistance was also authorized. Finally, this declaration made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified tornado events and the resulting damage totals in Kansas Region E for the period 2009 - 2018 (with 2009 and 2018 being full data set years).

Table 4.131: Kansas Region E NCEI Tornado Events, 2009 - 2018

County	Number of Days with Event	Property Damage	Deaths	Injuries	Highest Rated Tornado
Barber	6	$0	0	0	EF0
Barton	10	$985,000	0	2	EF3
Comanche	7	$85,000	0	0	EF2
Edwards	5	$1,500,000	0	0	EF3
Kiowa	6	$18,000	0	0	EF1
Pawnee	7	$335,000	0	0	EF4
Pratt	6	$0	0	0	EF0
Stafford	5	$0	2	1	EF3

Source: NOAA NCEI

The following provides both **local accounts** and NOAA NCEI descriptions of notable recorded events:

- **May 16, 2017: Pawnee Rock (Barton County)**
  This long track tornado moved in from Pawnee County. Law Enforcement reported the tornado just south of the county line near Pawnee Rock and then followed it as it moved to the NE. The tornado moved through the west side of Pawnee Rock causing sporadic EF1 and isolated EF2 damage to several homes and one school type facility. The tornado continued to move to the NNE causing EF2 damage to a couple of homes on West Barton County Road. One residence was a mobile home that lost the far east side of the structure and all roofing material. One injury was noted at that location as they did not seek shelter. The home just to the west lost the east half of structure with the occupants seeking refuge in the basement. Of note, a Ford F-150 was thrown or rolled approximately 75 to hundred yards away from its original location. Further to the NE, the tornado strengthened considerably as noted by complete destruction of an 1890 farmhouse. With the age of the home and no anchoring being present due to the structure resting on cinder blocks along with a lack of debarking, a higher rating could not be justified though the amount of devastation to the structure itself pointed towards a possible higher rating. Three occupants sought refuge in the basement and were unharmed. The next-door neighbor's home was also considerably damaged with all of the structure being demolished except for one corner section. The tornado then continued to the NE over open country damaging trees and power lines along the way before dissipating NW of Hoisington. A total of 44 parcels were affected. Ten homes were deemed total losses. The estimated property value losses were estimated at $658,000.

- **December 25, 2016: Wilmore (Comanche County)**
  This QLCS tornado overturned an irrigation sprinkler. Damages of $85,000 were reported.

- **May 18, 2013: Pawnee County**
  This tornado was well documented by storm chasers, spotters and a research team with portable doppler radar. The tornado did turn north towards the end of its life cycle. Low end EF4 damage was done to a home along US156. The roof and walls were blown away of this well constructed house. Several large tanks were carried a long distance. There were two people inside, but they escaped injury by taking shelter. Video shows that sub-vortices within the tornado may have had a little stronger wind. The Doppler on wheels that was observing the tornado had near surface measured wind speeds of 165 to 185 MPH. Damages of $140,000 were reported.

- **May 24, 2011: Ellinwood (Barton County)**
  The tornado touched down just outside of Ellinwood and moved to the northwest. The tornado caused considerable damage at one farmstead and moderate damage at two others. Most of the damage was limited to outbuildings such as barns and sheds. However, the residences did sustain some minor damage as well. One person was injured and damages of $250,000 were reported.

- **May 24, 2011: Hudson (Stafford County)**
  This tornado moved north/northwest and unfortunately claimed two lives. The tornado hit a house (among trees, outbuildings, fences) and the persons involved were parked under a tree in the driveway of the home. Tragically, the very large tree was uprooted and landed on the vehicle. A female that was in the back seat was severely injured. A female and her son in the front seat were crushed and apparently killed instantly. The house received EF2 damage and the occupant of the home was in the basement but arrived there less than 30 seconds before the tornado hit.

- **June 15, 2009: Hodges (Edwards County)**
  This tornado turned over 4 pivot irrigation sprinklers and destroyed two 80,000-bushel grain bins. In addition, a 500,000-bushel bin was heavily damaged. One of the 80,000 bins traveled nearly a mile. There was extensive rear flank downdraft damage in the vicinity of this tornado. Damages of $1,500,000 were reported.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of tornados on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates four tornado related claims on 654 acres causing $44,169 in loss.

Table 4.132: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Tornados

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	1	7	$689
Barton	0	0	$0
Comanche	0	0	$0
Edwards	1	198	$6,175
Kiowa	0	0	$0
Pawnee	2	101	$7,389
Pratt	0	0	$0
Stafford	0	0	$0

Source: USDA

4.19.3 – Hazard Probability Analysis

The following table summarizes tornado probability data for **Barber County**.

Table 4.133: Barber County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	6
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	1
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	7
Average Number of Acres Damaged per Year	1
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$689
Average Crop Damage per Year	$69

Source: NCEI and USDA

Data from the NCEI indicates that Barber County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $ 0 in property damages

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to tornado occurrences:

- <1 insurance claim
- One acre impacted
- $69 in insurance claims

The following table summarizes tornado probability data for **Barton County**.

Table 4.134: Barton County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	10
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	1
Average Number of Deaths or Injuries	<1
Total Reported NCEI Property Damage (2009-2018)	$985,000
Average Property Damage per Year	$98,500
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0

Table 4.134: Barton County Tornado Probability Summary

Data	Recorded Impact
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Barton County can expect on a yearly basis, relevant to tornado events:

- One event
- <1 deaths or injuries
- $ in property damages

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes Tornado probability data for **Comanche County**.

Table 4.135: Comanche County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	7
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$85,000
Average Property Damage per Year	$8,500
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Comanche County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $8,500 in property damages

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Edwards County**.

Table 4.136: Edwards County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	5
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$1,500,000
Average Property Damage per Year	$150,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	1
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	198
Average Number of Acres Damaged per Year	20
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$6,175
Average Crop Damage per Year	$618

Source: NCEI and USDA

Data from the NCEI indicates that Edwards County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $150,000 in property damages

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to tornado occurrences:

- <1 insurance claim
- 20 acres impacted
- $618 in insurance claims

The following table summarizes tornado probability data for **Kiowa County**.

Table 4.137: Kiowa County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	6
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	0

Table 4.137: Kiowa County Tornado Probability Summary

Data	Recorded Impact
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$18,000
Average Property Damage per Year	$1,800
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Kiowa County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $1,800 in property damages

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Pawnee County**.

Table 4.138: Pawnee County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	7
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$335,000
Average Property Damage per Year	$33,500
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	101
Average Number of Acres Damaged per Year	10
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$7,389
Average Crop Damage per Year	$739

Source: NCEI and USDA

Data from the NCEI indicates that Pawnee County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $33,500 in property damages

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to tornado occurrences:

- <1 insurance claim
- 10 acres impacted
- $739 in insurance claims

The following table summarizes Tornado probability data for **Pratt County**.

Table 4.139: Pratt County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	6
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Pratt County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims.

The following table summarizes Tornado probability data for **Stafford County**.

Table 4.140: Stafford County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	5
Average Events per Year	1
Number of Deaths or Injuries (2009-2018)	3
Average Number of Deaths or Injuries	<1
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Stafford County can expect on a yearly basis, relevant to tornado events:

- One event
- <1 death or injury
- $0 in property damages

According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims.

Based on the number of NCEI reported events we derive the following probability for event occurrence in Kanas Region E:

- **Tornado Probability:** Approximately seven events per year

However, if events are normalized for tornados rated above an EF2, we derive the following probability for event occurrence:

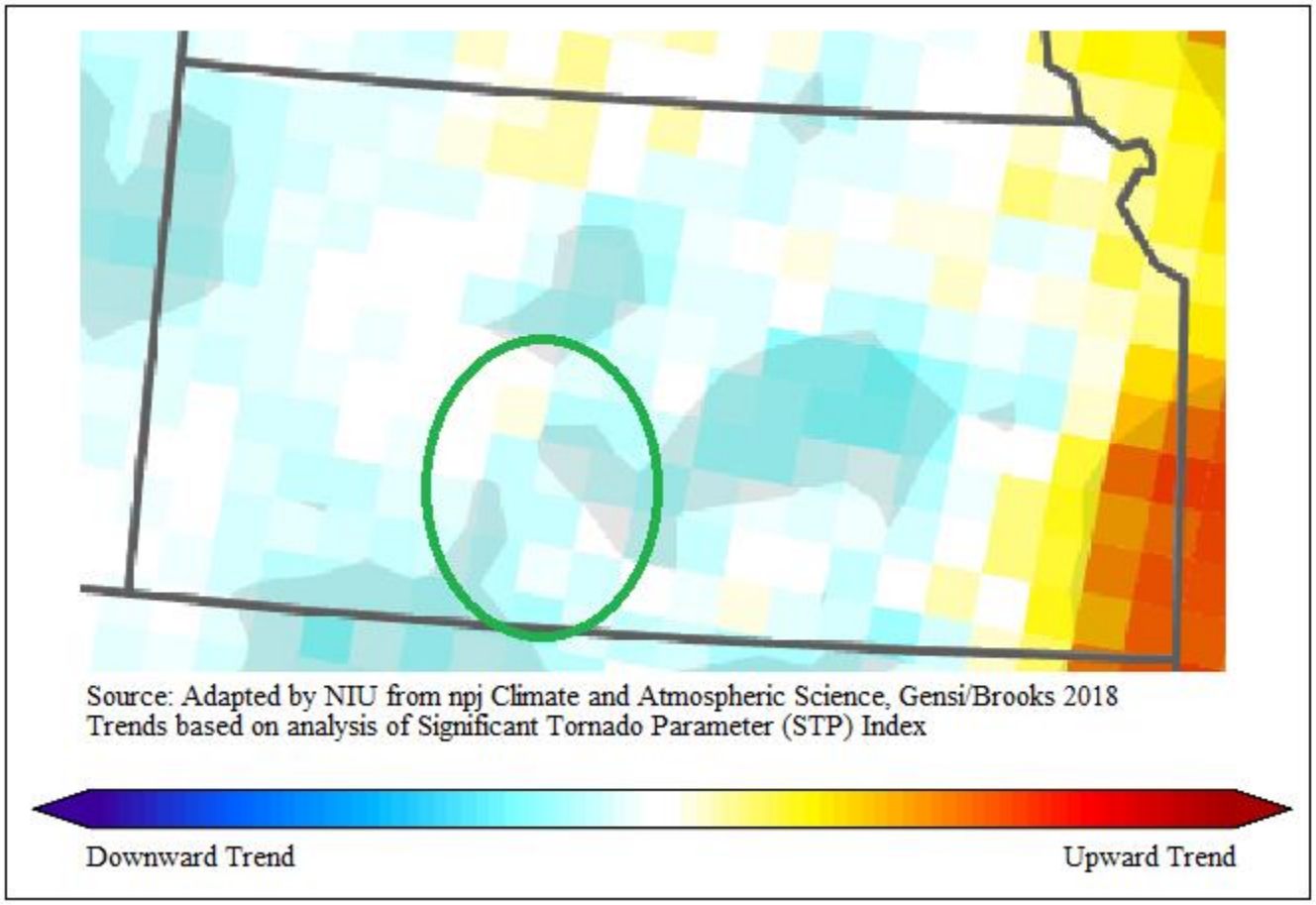
- **Probability of an EF2 or greater tornado:** One event per year

In addition, Kansas Region E has had eleven Presidentially Declared Disasters relating to tornados (and other concurrent events such as flooding) in the last 20 years. This represents an average of one declared tornado disaster per year.

Research conducted by the National Severe Storms Lab looked at Significant Tornado Parameter (STP) to help determine future tornado probability. STP is a measurement of the major parameters of tornado conditions, including wind speed and direction, wind at differing altitudes, unstable air patterns, and

humidity. The following map, generated by Northern Illinois University and compiled from STP data, indicates that Kansas Region E may see decreasing future number of tornados.

Tornado Environmental Frequency Trends



4.19.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to tornado events. Counties with a higher or increasing population, high, or increasing, or having a high structural valuation are to be considered to have a potentially greater vulnerability.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region E county incurring damage over the period 2009 to 2018 from tornado events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

Table 4.141: Kansas Region E Structural Vulnerability Data for Tornados, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Barber	$610,311,000	$0	0.00%
Barton	$3,331,357,000	$985,000	0.03%
Comanche	$222,342,000	$85,000	0.04%

Table 4.141: Kansas Region E Structural Vulnerability Data for Tornados, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Edwards	$408,386,000	$1,500,000	0.37%
Kiowa	$320,917,000	$18,000	0.01%
Pawnee	$794,977,000	$335,000	0.04%
Pratt	$1,209,374,000	$0	0.00%
Stafford	$515,938,000	$0	0.00%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to tornado events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.142: Kansas Region E Population Vulnerability Data for Tornados

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
STafford	4,178	-12.8%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of tornados on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to tornado events.

Table 4.143: Tornado Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	1	0.00%	$93,568,000	$69	0.00%
Barton	557,961	0	0.00%	$365,672,000	$0	0.00%
Comanche	453,556	0	0.00%	$51,803,000	$0	0.00%
Edwards	392,025	20	0.01%	$228,780,000	$618	0.00%
Kiowa	442,981	0	0.00%	$78,281,000	$0	0.00%
Pawnee	474,275	10	0.00%	$362,349,000	$739	0.00%
Pratt	465,191	0	0.00%	$271,307,000	$0	0.00%
Stafford	493,694	0	0.00%	$198,573,000	$0	0.00%

Source: USDA

Between 2001 and 2010 51% of those killed by tornados were living in mobile homes, according to the NOAA. A 2012 "Kansas Severe Weather Awareness Week" report indicates that people living in mobile homes are killed by tornados at a rate 20 times higher than people living in permanent homes. Additionally, a new study from Michigan State University reported that the two biggest factors related to tornado fatalities were housing quality (measured by mobile homes as a proportion of housing units) and income level. When a tornado strikes, a county with double the number of mobile homes as a proportion of all homes will experience 62% more fatalities than a county with fewer mobile homes, according to the study data.

The following participating jurisdictions may have increased vulnerability to tornado events due to having greater than 20% of housing stock as mobile homes:

- **Iuka** (Pratt County)
- **Preston** (Pratt County)

4.19.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.144: Tornado Consequence Analysis

Subject	Impacts of Tornado
Health and Safety of the Public	Impact of the immediate area could be severe depending on whether individuals were able to seek shelter and get out of the trajectory of the tornado. Casualties are dependent on warning systems and warning times.
Health and Safety of Responders	Impact to responders is expected to be minimal unless responders live within the affected area.
Continuity of Operations	Temporary to permanent relocation may be necessary if government facilities experience damage.
Property, Facilities, and Infrastructure	Localized impact could be severe in the trajectory path. Roads, buildings, and communications could be adversely affected. Damage could be severe.
Environment	Impact will be severe for the immediate impacted area. Impact will lessen as distance increases from the immediate incident area.
Economic Conditions	Impacts to the economy will greatly depend on the trajectory of the tornado. If a jurisdiction takes a direct hit then the economic conditions will be severe. With an indirect hit the impact could be low to severe.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Warning systems and warning time will also be questioned.

4.20 – Wildfire

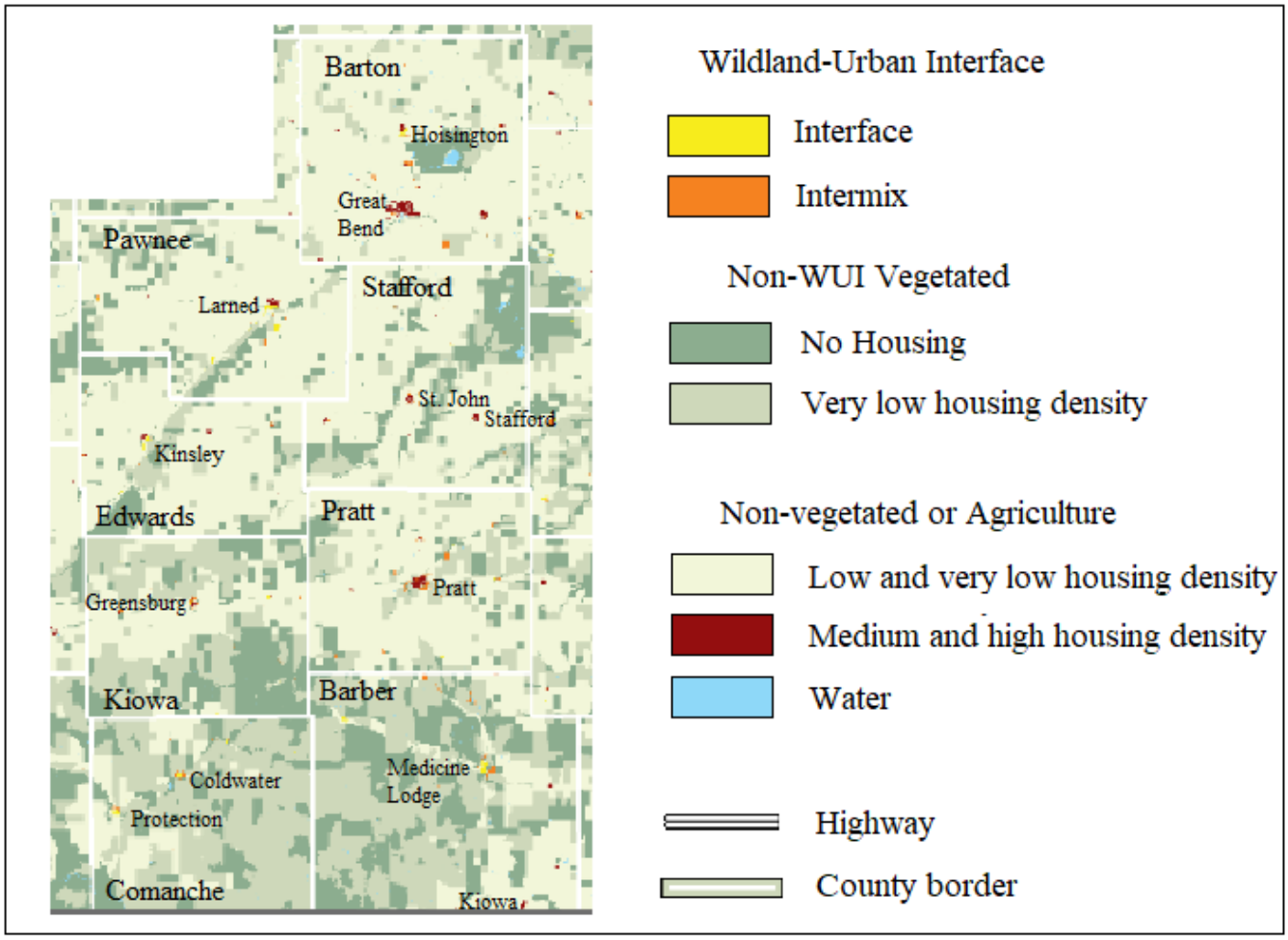
The NWS defines a wildfire as any free burning uncontainable wildland fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment. They can occur naturally, by human accident, and on rare occasions by human action. Population de-concentration in the U.S. has resulted in rapid development in the outlying fringe of metropolitan areas and in rural areas with attractive recreational and aesthetic amenities, especially forests. This expansion has increased the likelihood that wildfires will threaten life and property.

4.20.1 – Location and Extent

Wildfires in Kansas Region E typically originate in pasture or prairie areas following the ignition of dry grasses (by natural or human sources). According to the 2011 Kansas Forest Action Plan, with the exception of Eastern Redcedar, most forest types in Kansas do not pose significant fire management issues. However, grasslands, which make up a majority of the open areas in Kansas Region E, do pose fire management issues due to the expansion of the Wildland Urban Interface (WUI) in recent decades.

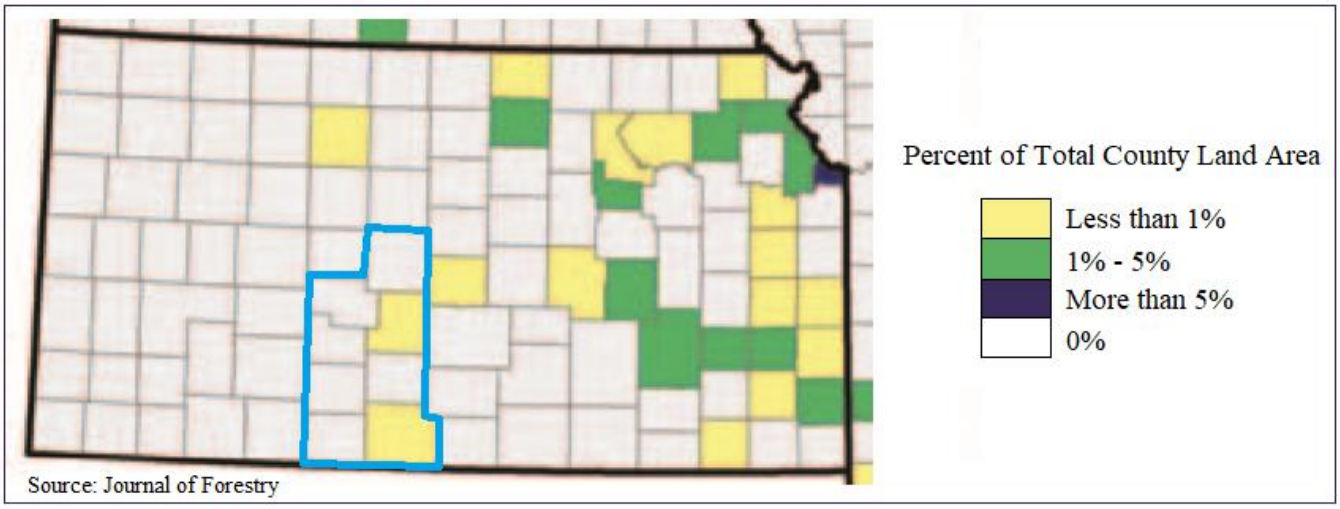
The WUI creates an environment in which fire can move readily between structural and vegetation fuels. Two types of WUI are mapped: intermixed and interface. Intermix WUI are areas where housing and vegetation intermingle; interface WUI are areas with housing in the vicinity of dense, contiguous wildland vegetation. The following maps detail WUI areas and information for Kansas Region E.

SILVIS Labs Regional WUI Map



The Eastern Redcedar is of concern to Kansas Region E. This invasive evergreen species can take over fence rows and un-planted fields, adding to wildfire fuel and risk. The following 2012 map, from the Journal of Forestry, indicates the percent of the total regional acreage impacted by Eastern Redcedar.

Percent of Total Regional Land Area of Eastern Redcedar



4.20.2 – Previous Occurrences

In the 20-year period from 1999 to present, there have been no Presidential Disaster Declarations for Kansas Region E for wildfires. In the 20-year period from 1999 to present, there have been two Fire Management Assistance Declarations for the region, as follows:

- FM5176: Declared on March 6, 2017 – This wildfire burned roughly 509,000 acres in Clark and Comanche counties and to date was the largest fire in Kansas History. Including Oklahoma, it burned a total of 662,687 acres.
- FM5120: Declared on March 23, 2016 – This fire started northwest of Alva, Oklahoma but quickly moved into Comanche and Barber counties. By the time it was contained, the fire had consumed nearly 275,000 acres in Kansas. Many structures were damaged or destroyed, with $706,000 in livestock loss and $27,000,000 in fencing. Additionally, four bridges were destroyed. Fortunately, there were no deaths or serious injuries. Total cost was estimated at $30,133,000

The Office of the State of Kansas Fire Marshall's Office (KSFM) was contacted concerning the size and origin of reported wildfires for the region. The following table lists all recorded wildfires, by county, for the six-year period 2013-2018 (currently available data, with 2013 and 2018 being full data set years).

Table 4.145: Kansas Region E State Fire Marshall Recorded Wildfire Events, 2013-2018

County	Number of Reported Fires	Deaths	Injuries	Buildings Burned	Burned Acres
Barber	21	0	1	43	275,152
Barton	41	0	0	0	1,466
Comanche	27	0	0	1	117,792
Edwards	10	0	0	0	335
Kiowa	4	0	0	0	44
Pawnee	26	0	0	0	1,830
Pratt	22	0	0	0	805
Stafford	25	0	0	2	5,916

Source: KSFM

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of wildfires on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates four wildfire related claims on 45 acres for $836.

Table 4.146: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Wildfires

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	0	0	$0
Barton	3	44	$787
Comanche	0	0	$0
Edwards	1	1	$49
Kiowa	0	0	$0
Pawnee	0	0	$0
Pratt	0	0	$0
Stafford	0	0	$0

Source: USDA

4.20.3 – Hazard Probability Analysis

The following table summarizes wildfire probability data for **Barber County**.

Table 4.147: Barber County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	21
Average Events per Year	4
Number Deaths or Injuries (2013-2018)	1
Average Number of Yearly Deaths and Injuries	<1
Total Reported Burned Buildings (2013-2018)	43
Average Burned Buildings per Year	7
Total Reported Burned Acres (2013-2018)	275,152
Average Burned Acres per Year	45,859
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Barber County can expect on a yearly basis, relevant to wildfire events:

- Four events
- <1 death or injury
- Seven buildings burned
- 45,859 acres burned

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Barton County**.

Table 4.148: Barton County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	41
Average Events per Year	7
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries	0
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	1,466
Average Burned Acres per Year	244
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	3
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	44
Average Number of Acres Damaged per Year	4
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$787
Average Crop Damage per Year	$79

Source: KSFM and NOAA

Data from the KSFM indicates that Barton County can expect on a yearly basis, relevant to wildfire events:

- Seven events
- No deaths or injuries
- No buildings burned
- 244 acres burned

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to wildfire occurrences:

- <1 insurance claims
- Four acres impacted
- $79 in insurance claims

The following table summarizes wildfire probability data for **Comanche County**.

Table 4.149: Comanche County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	27
Average Events per Year	5

Table 4.149: Comanche County Wildfire Probability Summary

Data	Recorded Impact
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries	0
Total Reported Burned Buildings (2013-2018)	1
Average Burned Buildings per Year	<1
Total Reported Burned Acres (2013-2018)	117,792
Average Burned Acres per Year	19,632
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Comanche County can expect on a yearly basis, relevant to wildfire events:

- Five events
- No deaths or injuries
- <1 building burned
- 19,632 acres burned

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Edwards County**.

Table 4.150: Edwards County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	10
Average Events per Year	2
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries	0
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	335
Average Burned Acres per Year	56
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	1
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	1
Average Number of Acres Damaged per Year	0

Table 4.150: Edwards County Wildfire Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$49
Average Crop Damage per Year	$5

Source: KSFM and NOAA

Data from the KSFM indicates that Edwards County can expect on a yearly basis, relevant to wildfire events:

- Two events
- No deaths or injuries
- No buildings burned
- 56 acres burned

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to wildfire occurrences:

- <1 insurance claims
- <1 acre impacted
- $5 in insurance claims

The following table summarizes wildfire probability data for **Kiowa County**.

Table 4.151: Kiowa County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	4
Average Events per Year	1
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries	0
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	44
Average Burned Acres per Year	7
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Kiowa County can expect on a yearly basis, relevant to wildfire events:

- One event
- No deaths or injuries
- No buildings burned
- Seven acres burned

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Pawnee County**.

Table 4.152: Pawnee County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	26
Average Events per Year	4
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries	0
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	1,830
Average Burned Acres per Year	305
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Pawnee County can expect on a yearly basis, relevant to wildfire events:

- Four events
- No deaths or injuries
- No buildings burned
- 305 acres burned

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Pratt County**.

Table 4.153: Pratt County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	22
Average Events per Year	4
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries	0
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	805
Average Burned Acres per Year	134
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Pratt County can expect on a yearly basis, relevant to wildfire events:

- Four events
- No deaths or injuries
- No buildings burned
- 134 acres burned

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Stafford County**.

Table 4.154: Stafford County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	25
Average Events per Year	4
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries	0
Total Reported Burned Buildings (2013-2018)	2
Average Burned Buildings per Year	<1
Total Reported Burned Acres (2013-2018)	5,916
Average Burned Acres per Year	986
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0

Table 4.154: Stafford County Wildfire Probability Summary

Data	Recorded Impact
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Stafford County can expect on a yearly basis, relevant to wildfire events:

- Four events
- No deaths or injuries
- <1 building burned
- 986 acres burned

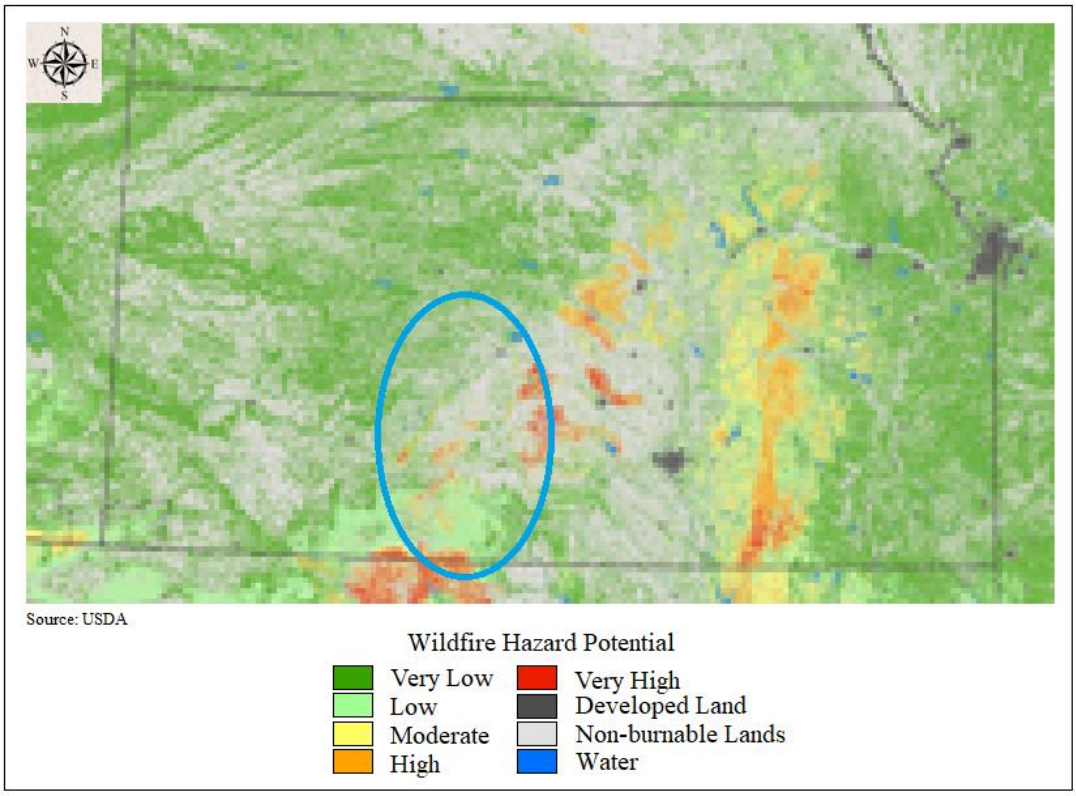
According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

In addition, in the 20-year period from 1999 to present there have been two Fire Management Assistance Declarations for the region. This represents an average of less than one declared Fire Management Assistance event per year.

Mapping created by the USDA in 2018 indicates the Wildfire Hazard Potential for the United States. The map indicates that the majority of Kansas Region E is in the low to very low potential class, however areas in the very high potential class are noted.

USDA Wildfire Potential Map



4.20.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to wildfire events. Counties with a higher or increasing population, high, or increasing, or having a high structural valuation are to be considered to have a potentially greater vulnerability.

The following table presents data from HAZUS and KSFM concerning the structures and the percentage of structures for each Kansas Region E county incurring damage over the six-year period of 2013 to 2018 (current available data) from wildfire events. As KSFM did not assign a value to the structures burned, an estimate of $32,000 per structure (value determined using a commercial cost calculator for an 800 square foot general purpose barn at $40 per square foot) was used as reports indicate the majority of structures burned were farm out-buildings. The greater the percentage of structures damaged the greater overall vulnerability going forward.

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Table 4.155: Kansas Region E Structural Vulnerability Data for Wildfires, 2009-2018

County	HAZUS Building Valuation	KSFM Structure Damage	Percentage of Building Valuation Damaged
Barber	$610,311,000	$1,376,000	0.23%
Barton	$3,331,357,000	$0	0.00%
Comanche	$222,342,000	$32,000	0.01%
Edwards	$408,386,000	$0	0.00%
Kiowa	$320,917,000	$0	0.00%
Pawnee	$794,977,000	$0	0.00%

Table 4.155: Kansas Region E Structural Vulnerability Data for Wildfires, 2009-2018

County	HAZUS Building Valuation	KSFM Structure Damage	Percentage of Building Valuation Damaged
Pratt	$1,209,374,000	$0	0.00%
Stafford	$515,938,000	$64,000	0.01%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to wildfire events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.156: Kansas Region E Population Vulnerability Data for Wildfires

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of wildfires on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to wildfire events.

Table 4.157: Wildfire Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	0	0.00%	$93,568,000	$0	0.00%
Barton	557,961	4	0.00%	$365,672,000	$79	0.00%
Comanche	453,556	0	0.00%	$51,803,000	$0	0.00%
Edwards	392,025	0	0.00%	$228,780,000	$5	0.00%
Kiowa	442,981	0	0.00%	$78,281,000	$0	0.00%
Pawnee	474,275	0	0.00%	$362,349,000	$0	0.00%
Pratt	465,191	0	0.00%	$271,307,000	$0	0.00%
Stafford	493,694	0	0.00%	$198,573,000	$0	0.00%

Source: USDA

Potentially lessening future vulnerability to wildfires are Community Wildfire Protection Plans (CWPPs). A CWPP is the most effective way to take advantage of various Federal programs to include the Healthy

Forests Restoration Act. By having a CWPP, communities are given priority for funding of Healthy Forests Restoration Act hazardous fuels reduction projects. The three main components of a CWPP are:

- Collaboration between all affected or potentially affected jurisdictions,
- Assessment of the wildfire hazards in an area that leads to recommendation for prioritized fuel reduction, and
- A section on recommendations towards reducing structural ignitability.

Currently the following Kansas Region E counties have approved CWPPs.

- Kiowa County

4.20.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.158: Wildfire Consequence Analysis

Subject	Impacts of Wildfire
Health and Safety of the Public	Impact could be severe for people living and working in the immediate area. Surrounding communities may also be impacted by evacuees.
Health and Safety of Responders	Impact to responders could be severe depending on the size and scope of the fire, especially for firefighters. Impact will be low to moderate for support responders with the main threat as smoke inhalation.
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage.
Property, Facilities, and Infrastructure	Delivery of services could be affected if there is any disruption to the roads and/or utilities due to damages sustained.
Environment	Impact will be severe for the immediate area with regards to trees, bushes, animals, and crops. Impact will lessen as distance increases.
Economic Conditions	Impacts to the economy could be moderate in the immediate area.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Evacuation orders and shelter availability could be called in to question.

4.21 – Windstorm

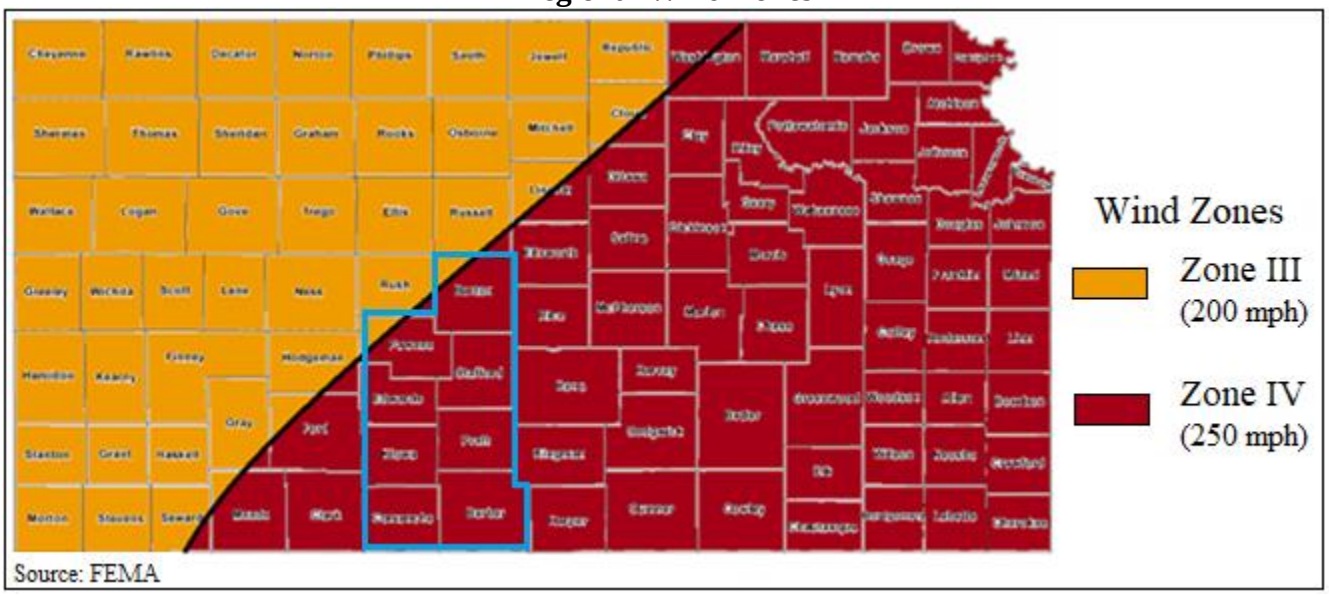
Straight-line winds are generally any thunderstorm wind that is not associated with rotation. It is these winds, which can exceed 100 mph that represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornados, the associated wind damage can be extensive and affect entire counties or regions. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

4.21.1 – Location and Extent

High winds occur over broad geographic regions. The entire Kansas Region E planning area, including all participating jurisdictions, is at risk to high wind events.

The following figure shows the wind zones of the United States based on maximum wind speeds. Kansas Region E is located within wind zone IV, the highest inland category.

Regional Wind Zones



Source: FEMA

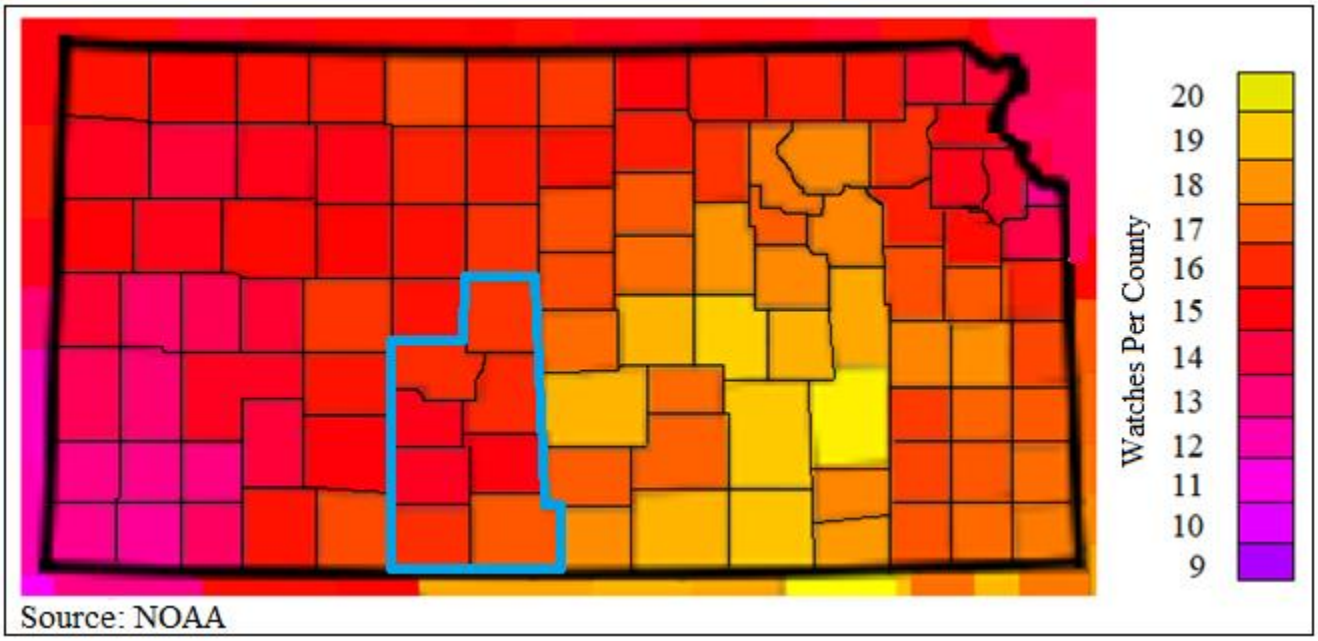
Severe thunderstorms strike Kansas Region E regularly, with accompanying high wind that can cause injury, death, and property damage. The widespread and frequent nature of thunderstorms makes high wind a relatively common occurrence. The NWS classifies thunderstorms, often the generator of high winds, using the following categories.

- **Marginal:** Isolated severe thunderstorms, limited in duration and/or coverage and/or intensity
- **Slight:** Scattered severe storms possible, Short-lived and/or not widespread, isolated intense storms possible

- **Enhanced:** Numerous severe storms possible, more persistent and/or widespread, a few intense
- **Moderate:** Widespread severe storms likely, long-lived, widespread and intense
- **High:** Widespread severe storms expected, long-lived, very widespread and particularly intense

The following map, generated by NOAA, indicates the average number severe thunderstorm watches per year for Kansas Region E.

Annual Average Thunderstorm Watches per Year (20-Year Average 1993-2012)



To measure wind speed and its correlating potential for damage, experts use the Beaufort scale as shown below.

Table 4.159: Beaufort Scale

Beaufort Number	Wind Speed (mph)	Effects on Land
0	Under 1	Calm, smoke rises vertically
1	1-3	Smoke drift indicates wind direction, vanes do not move
2	4-7	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Leaves, small twigs in constant motion. Light flags extended.
4	13-18	Dust, leaves and loose paper raised up, small branches move
5	19-24	Small trees begin to sway
6	25-31	Large branches of trees in motion, whistling heard in wires
7	32-38	While trees in motion, resistance felt in walking against the wind
8	39-46	Twigs and small branches broken off trees
9	47-54	Slight structural damage occurs, slate blown from roofs
10	55-63	Seldom experienced on land, trees broken, structural damage occurs
11	64-72	Very rarely experienced on land, usually with widespread damage
12	73 or higher	Violence and destruction

4.21.2 – Previous Occurrences

In the 20-year period from 1999 to present, there have been eight Presidential Disaster Declarations for Kansas Region E for Straight-Line Winds (along with other associates hazard events). The following 20-year information (with 1999 and 2018 being full data years) on past declared disasters is presented to provide a historical perspective on high wind events that have impacted Kansas Region E. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2014.

Table 4.160: Kansas Region E FEMA Straight-Line Winds Disaster and Emergency Declarations, 1999 -2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28/2019 – 07/12/2019)	Severe Storms, **Straight-line Winds**, Tornados, Flooding, Landslides, and Mudslides	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Pawnee, and Pratt	$590,356
4417	02/25/2019 (10/04-10/15/2018)	Severe Storms, **Straight-line Winds**, And Flooding	Barber, Barton, and Pratt	$445,154
4403	10/19/2018 (09/01-09/08/2019)	Severe Storms, **Straight-line Winds**, And Flooding	Barber, Kiowa, And Pratt	$1,343,151
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, Tornados, **Straight-line Winds**, and Flooding	Barton and Edwards	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, **Straight-line Winds**, Tornados, and Flooding	Barber, Barton, Comanche, Edwards, Elk, Ellsworth, Kiowa, Pawnee, and Pratt	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, Tornados, **Straight-line Winds** and Flooding	Edwards, Kiowa, and Stafford	$6,923,919
4010	07/29/2011 (5/19-6/4/2011)	Severe Storms, **Straight-line Winds**, Tornados and Flooding	Barton and Stafford	$8,259,620
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, **Straight-line Winds**, and Tornados	Barber	$15,013,488

Source: FEMA
-: Data unavailable

The following provides details concerning Presidential Disaster Declarations DR 4230 for Kansas Region E. FEMA summary writeups concerning declarations DR-4449, DR-4417 and DR-4403 were unavailable.

Kansas – Severe Storms, Tornados, Straight-Line Winds, and Flooding
FEMA-4230-DR
Declared July 20, 2015

On July 1, 2015, Governor Sam Brownback requested a major disaster declaration due to severe storms, tornados, straight-line winds, and flooding during the period of May 4 to June 21, 2015. The Governor requested a declaration for Public Assistance, including direct federal assistance for 42 counties and Hazard Mitigation statewide. During the period of May 4 to June 27, 2015, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On July 20, 2015, President Obama declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, tornados, straight-line winds, and flooding in Atchison, Barton, Brown, Barber, Chase, Chautauqua, Cherokee, Cheyenne, Clay, Cloud, Barton, Barton, Doniphan, Edwards, Elk, Ellsworth, Comanche, Gray, Greenwood, Comanche, Haskell, Hodgeman, Jackson, Jefferson, Jewell, Lyon, Pratt, Marshall, Pawnee, Meade, Kiowa, Morris, Nemaha, Neosho, Pawnee, Pottawatomie, Republic, Rice, Stevens, Sumner, Wabaunsee, and Washington Counties. Direct Federal assistance was also authorized. Finally, this declaration made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified high wind events (High Wind and Thunderstorm Wind) and the resulting damage totals in Kansas Region E for the period 2009 - 2018 (with 2009 and 2018 being full data set years).

Table 4.161: Kansas Region E NCEI High Wind Events, 2009 - 2018

County	Number of Days with Events	Property Damage	Deaths	Injuries	Highest Recorded Wind Speed
Barber	53	$0	0	1	81 Knots
Barton	62	$801,650	0	0	73 Knots
Comanche	26	$5,000	0	0	74 Knots
Edwards	21	$0	0	1	78 Knots
Kiowa	22	$0	0	0	83 Knots
Pawnee	30	$107,000	0	0	75 Knots
Pratt	45	$534,000	0	0	87 Knots
Stafford	31	$72,000	0	0	77 Knots

Source: NOAA NCEI

The following provides both **local accounts** and NOAA NCEI descriptions of notable recorded events:

- **June 15, 2017: Stubbs (Barber County)**
  A semi-truck was blown off the road by the high wind. The driver suffered non-life-threatening head injuries but was taken to the hospital.

- **September 10, 2015: Great Bend (Barton County**
  Eighty percent of the roof was blown off the gymnasium at Lincoln Elementary. Property damage was recorded at $50,000.

- **April 2, 2015: Preston (Pratt County**
  Several pivot irrigation systems were overturned by the wind. Property damage was recorded at $150,000.

- **June 18, 2011: Ardell (Edwards County)**
  A truck driver from an overturned semi on Highway 50 had several deep cuts and gashes.

- **August 14, 2010: Larned (Pawnee County)**
  Damage at the Heritage Feeders was reported. There were many tall standing structures with some sort of damage, including the feed mill, concrete silo, sheds and concrete walls tipped over. Property damage was recorded at $100,000.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of high on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates 191 high wind related claims on 22,545 acres for $2,912,701.

Table 4.162: USDA Risk Management Agency Cause of Loss
Indemnities 2009-2018, High Winds

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	6	386	$114,466
Barton	28	2,570	$221,416
Comanche	7	1,099	$103,517
Edwards	24	3,569	$563,015
Kiowa	27	2,337	$269,401
Pawnee	31	3,741	$471,036
Pratt	41	5,362	$861,442
Stafford	27	3,482	$308,410

Source: USDA

4.21.3 – Hazard Probability Analysis

The following table summarizes high wind probability data for **Barber County**.

Table 4.163: Barber County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	53
Average Events per Year	5
Number of Days with Event and Death or Injury (2009-2018)	1
Average Number of Days with Death or Injury	<1
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Table 4.163: Barber County High Wind Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	6
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	386
Average Number of Acres Damaged per Year	39
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$114,466
Average Crop Damage per Year	$11,447

Source: NCEI and USDA

Data from the NCEI indicates that Barber County can expect on a yearly basis, relevant to high wind events:

- Five events
- <1 death or injury
- $0 in property damages

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to high wind occurrences:

- One insurance claim
- 39 acres impacted
- $11,447 in insurance claims

The following table summarizes high wind probability data for **Barton County**.

Table 4.164: Barton County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	62
Average Events per Year	6
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$801,650
Average Property Damage per Year	$80,165
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	28
Average Number of Claims per Year	3
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	2,570
Average Number of Acres Damaged per Year	257
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$221,416
Average Crop Damage per Year	$22,142

Source: NCEI and USDA

Data from the NCEI indicates that Barton County can expect on a yearly basis, relevant to high wind events:

- Six events

- No deaths or injuries
- $ in property damages

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to high wind occurrences:

- Three insurance claim
- 257 acres impacted
- $22,142 in insurance claims

The following table summarizes High wind probability data for **Comanche County**.

Table 4.165: Comanche County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	26
Average Events per Year	3
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$5,000
Average Property Damage per Year	$500
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	7
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	1,099
Average Number of Acres Damaged per Year	110
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$103,517
Average Crop Damage per Year	$10,352

Source: NCEI and USDA

Data from the NCEI indicates that Comanche County can expect on a yearly basis, relevant to high wind events:

- Three events
- No deaths or injuries
- $500 in property damages

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to high wind occurrences:

- One insurance claim
- 110 acres impacted
- $10,352 in insurance claims

The following table summarizes high wind probability data for **Edwards County**.

Table 4.166: Edwards County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	21
Average Events per Year	2
Number of Days with Event and Death or Injury (2009-2018)	1
Average Number of Days with Death or Injury	<1
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	24
Average Number of Claims per Year	2
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	3,569
Average Number of Acres Damaged per Year	357
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$563,015
Average Crop Damage per Year	$56,301

Source: NCEI and USDA

Data from the NCEI indicates that Edwards County can expect on a yearly basis, relevant to high wind events:

- Two events
- <1 death or injury
- $0 in property damages

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to high wind occurrences:

- Two insurance claim
- 357 acres impacted
- $56,301 in insurance claims

The following table summarizes high wind probability data for **Kiowa County**.

Table 4.167: Kiowa County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	22
Average Events per Year	2
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	27
Average Number of Claims per Year	3
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	2,337
Average Number of Acres Damaged per Year	234
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$269,401
Average Crop Damage per Year	$26,940

Source: NCEI and USDA

Data from the NCEI indicates that Kiowa County can expect on a yearly basis, relevant to high wind events:

- Two events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to high wind occurrences:

- Three insurance claim
- 234acres impacted
- $26,940 in insurance claims

The following table summarizes high wind probability data for **Pawnee County**.

Table 4.168: Pawnee County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	30
Average Events per Year	3
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$107,000
Average Property Damage per Year	$10,700
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	31
Average Number of Claims per Year	3
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	3,741
Average Number of Acres Damaged per Year	374
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$471,036
Average Crop Damage per Year	$47,104

Source: NCEI and USDA

Data from the NCEI indicates that Pawnee County can expect on a yearly basis, relevant to high wind events:

- Three events
- No deaths or injuries
- $10,700 in property damages

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to high wind occurrences:

- Three insurance claim
- 374 acres impacted
- $47,104 in insurance claims

The following table summarizes High wind probability data for **Pratt County**.

Table 4.169: Pratt County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	45
Average Events per Year	5
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$534,000
Average Property Damage per Year	$53,400
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	41
Average Number of Claims per Year	4
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	5,362
Average Number of Acres Damaged per Year	536
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$861,442
Average Crop Damage per Year	$86,144

Source: NCEI and USDA

Data from the NCEI indicates that Pratt County can expect on a yearly basis, relevant to high wind events:

- Five events
- No deaths or injuries
- $53,400 in property damages

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to high wind occurrences:

- Four insurance claim
- 536 acres impacted
- $86,144 in insurance claims

The following table summarizes High wind probability data for **Stafford County**.

Table 4.170: Stafford County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	31
Average Events per Year	3
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$72,000
Average Property Damage per Year	$7,200
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	27
Average Number of Claims per Year	3
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	3,482
Average Number of Acres Damaged per Year	348
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$308,410

Table 4.170: Stafford County High Wind Probability Summary

Data	Recorded Impact
Average Crop Damage per Year	$30,841

Source: NCEI and USDA

Data from the NCEI indicates that Stafford County can expect on a yearly basis, relevant to high wind events:

- Three events
- No deaths or injuries
- $7,200 in property damages

According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to high wind occurrences:

- Three insurance claim
- 348 acres impacted
- $30,841 in insurance claims

In addition, Kansas Region E has had eight Presidentially Declared Disaster relating to straight-line winds (and other concurrent events) in the last 20 years. This represents an average of less than one declared straight-line wind disaster per year.

4.21.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to high wind events. Counties with a higher or increasing population, and/or a high or increasing structural valuation are considered to have a potentially greater vulnerability.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region E county incurring damage over the period 2009 to 2018 from high wind events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

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Table 4.171: Kansas Region E Structural Vulnerability Data for High Winds, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Barber	$610,311,000	$0	0.00%
Barton	$3,331,357,000	$801,650	0.02%
Comanche	$222,342,000	$5,000	0.00%
Edwards	$408,386,000	$0	0.00%
Kiowa	$320,917,000	$0	0.00%
Pawnee	$794,977,000	$107,000	0.01%
Pratt	$1,209,374,000	$534,000	0.04%
Stafford	$515,938,000	$72,000	0.01%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to high wind events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.172: Kansas Region E Population Vulnerability Data for High Wind

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of high wind on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to high wind events.

Table 4.173: High Wind Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	39	0.01%	$93,568,000	$11,447	0.01%
Barton	557,961	257	0.05%	$365,672,000	$22,142	0.01%
Comanche	453,556	110	0.02%	$51,803,000	$10,352	0.02%
Edwards	392,025	357	0.09%	$228,780,000	$56,301	0.02%
Kiowa	442,981	234	0.05%	$78,281,000	$26,940	0.03%
Pawnee	474,275	374	0.08%	$362,349,000	$47,104	0.01%
Pratt	465,191	536	0.12%	$271,307,000	$86,144	0.03%
Stafford	493,694	348	0.07%	$198,573,000	$30,841	0.02%

Source: USDA

As with tornados, the following participating jurisdictions may have increased vulnerability to windstorm events due to having greater than 20% of housing stock as mobile homes:

- **Iuka (Pratt County)**
- **Preston (Pratt County)**

4.21.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.174 : High Wind Consequence Analysis

Subject	Impacts of High Winds
Health and Safety of the Public	Impact of the immediate area could be severe depending on whether individuals were able to seek shelter. Casualties are dependent on warning systems and warning times.
Health and Safety of Responders	Impact to responders is expected to be minimal unless responders live within the affected area.
Continuity of Operations	Temporary to permanent relocation may be necessary if government facilities experience damage.
Property, Facilities, and Infrastructure	Localized impact could be severe in the wind path. Roads, buildings, and communications could be adversely affected. Damage could be severe.
Environment	Impact will be severe for the immediate impacted area. Impact will lessen as distance increases from the immediate incident area.
Economic Conditions	Impacts to the economy will greatly depend on the wind severity. Potential economic impact conditions could be minor to severe.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Warning systems and warning time will also be questioned.

4.22 – Winter Storms

Winter weather in Kansas Region E usually come in the form of light to heavy snow or freezing rain. A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. Heavy accumulations of ice, often the result of freezing rain, can bring down trees, utility poles, and communications towers and disrupt communications and power for days.

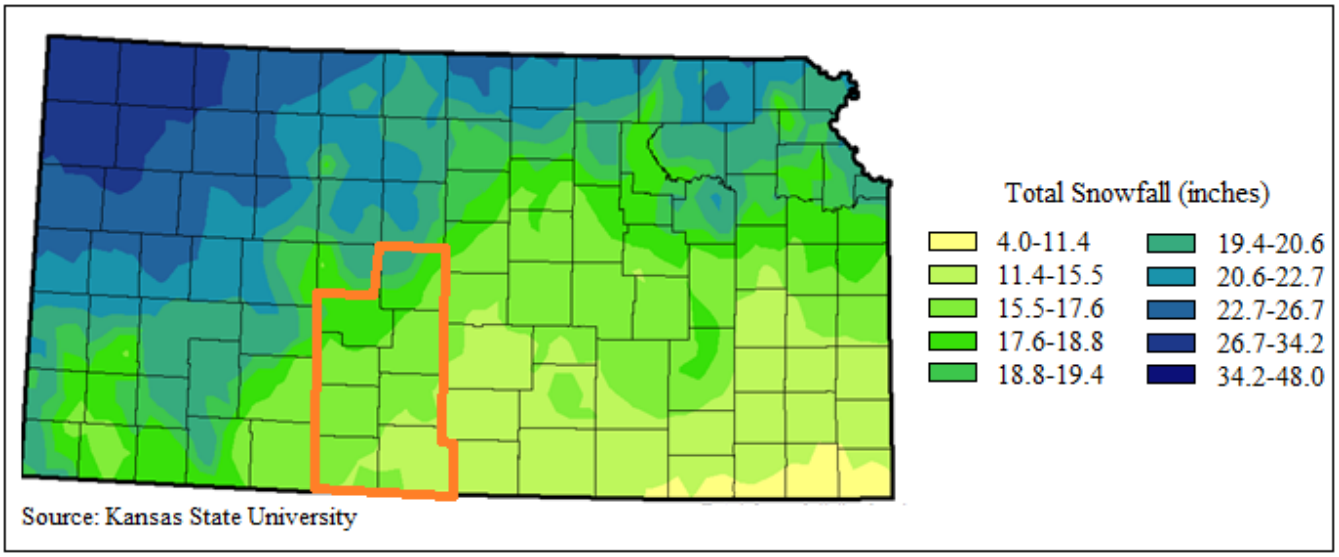
4.22.1 – Location and Extent

All of Kansas Region E is susceptible to severe winter storms. For winter weather, the NWS describes the different types of events as follows:

- **Blizzard:** Winds of 35 mph or more with snow and blowing snow reducing visibility to less than 1/4 mile for at least three hours.
- **Blowing Snow:** Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls:** Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers:** Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain:** Rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet:** Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

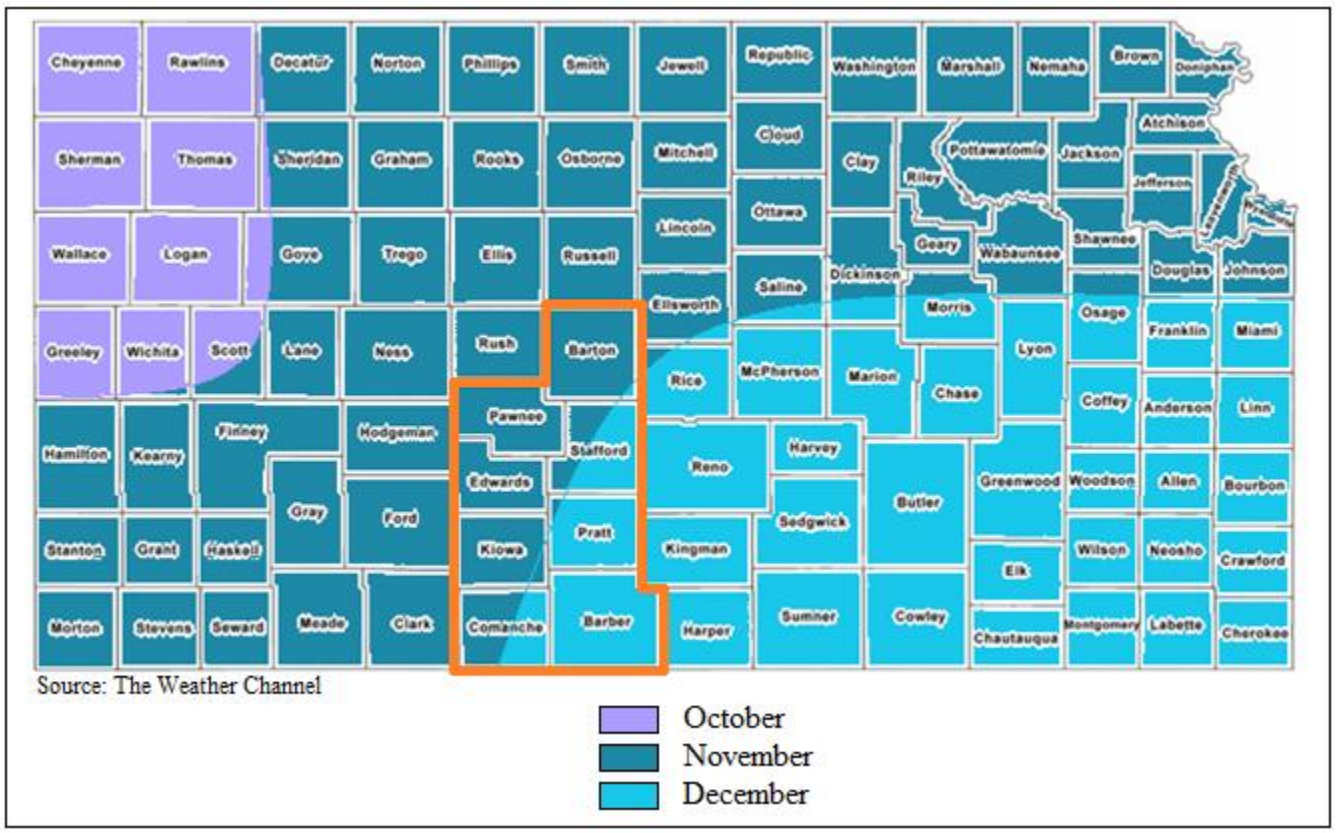
The following map, generated Kansa State University, using the latest available data, indicates the average annual snowfall for Kansas Region E for a given year.

Average Annual Snowfall, 1981-2010



Additionally, as indicated by the map below, Kansas Region E can expect to receive the first measurable snow in November to December of each year.

Average Date of First Measurable Snow



4.22.2 – Previous Occurrences

In the 20-year period from 1999 to present, there have been seven Presidential Disaster Declarations for Kansas Region E for severe winter storms. The following 20-year information (with 1999 and 2018 being full data years) on past declared disasters is presented to provide a historical perspective on winter storm events that have impacted Kansas Region E. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2014.

Table 4.175: Kansas Region E FEMA Severe Winter Storms Disaster and Emergency Declarations, 1999 - 2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4304	02/24/2017 (01/13/2017 – 01/16/2017)	**Severe Winter Storm**	Comanche, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$8,027,446
4112	04/26/2013 (02/20-02/23/2013)	**Snowstorm**	Barber, Barton, Pawnee, Pratt, and Stafford.	$1,102,861
1741	02/01/2008	**Severe Winter Storms**	Barber, Barton, Comanche, Edwards, Kiowa, Pawnee, Pratt, and Stafford	$359,557,345
1675	1/7/2007 (12/28-30/2006)	**Severe Winter Storm**	Comanche, Edwards, Kiowa, Pawnee, and Stafford	$315,201,639
1626	1/26/2006 (11/27-28/2005)	**Severe Winter Storm**	Edwards and Pawnee	$50,281,517
1579	2/8/2005 (1/4-6/2005)	**Severe Winter Storm, Heavy Rains, and Flooding**	Barber, Comanche, Kiowa, and Pratt	$106,873,672
1402	2/6/2002 (1/29-2/15/2002)	**Ice Storm**	Barber, Comanche, Kiowa, and Pratt	$60,185,754

Source: FEMA

The following provides details concerning Presidential Disaster Declarations DR 4304 for Kansas Region E.

FEMA-4304-DR
Kansas – Severe Winter Storm
Declared February 24, 2017

On February 13, 2017, Governor Sam Brownback requested a major disaster declaration due to a severe winter storm during the period of January 13-16, 2017. The Governor requested a declaration for Public Assistance for 23 counties and Hazard Mitigation statewide. During the period of January 25 to February 7, 2017, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective

response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On February 24, 2017, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storm in Barton, Clark, Comanche, Edwards, Ellsworth, Ford, Hodgeman, Jewell, Kiowa, Meade, Ness, Pawnee, Pratt, Rush, Seward, Sheridan, Stafford, and Trego Counties. This declaration also made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

The following presents NOAA NCEI data concerning winter storm events in Kansas Region E. It is worth noting that the NCEI data is regional, and sometimes statewide. As such reported damage is not specific to a regional county nor to any of the participating jurisdictions.

Table 4.176: Kansas Region E NCEI Winter Storm Events, 2009 - 2018

Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
Blizzards	4	$50,000	0	0
Ice Storm	4	$0	0	0
Winter Storms	5	$0	0	0

Source: NOAA NCEI

The following provides both **local accounts** and NOAA NCEI descriptions of notable recorded events:

- **November 25, 2018: Regional**
  A blizzard swept through most of Central Kansas on the 25th from early in the morning until mid-afternoon.
- **January 16, 2017: Regional**
  Ice accretion was 1 to 1 1/2 inches. Water equivalent was 2 to 3 inches. Tree and power line damage was extensive.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of winter storms on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years), for the region, indicates 655 winter storm related claims on 277,561 acres for $21,793,227.

Table 4.177: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Winter Storms

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Barber	80	33,851	$2,948,324
Barton	101	32,074	$2,151,723
Comanche	35	21,103	$1,226,660
Edwards	81	30,122	$3,003,809
Kiowa	54	24,288	$2,295,117
Pawnee	101	37,775	$3,258,500

Table 4.177: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Winter Storms

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Pratt	77	45,003	$2,987,921
Stafford	126	53,345	$3,921,173

Source: USDA

4.22.3 – Hazard Probability Analysis

For probability purposes, each component of severe winter storms was examined and combined. The following table summarizes winter storm event data for Kansas Region E.

Table 4.178: Kansas Region E Winter Storm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2009-2018)	13
Average Event Days per Year	1
Number of Days with Event and Death or Injury (2009-2018)	0
Average Number of Yearly Deaths and Injuries (2009-2018)	0
Total Reported NCEI Property Damage (2009-2018)	$50,000
Average Property Damage per Year	$5,000

Source: NCEI

Data from the NCEI indicates that Kansas Region E can expect on a yearly basis, relevant to winter storm events:

- One events
- No deaths or injuries
- $5,000 in property damages

The following table summarizes USDA Risk Management Agency winter storm event data for **Barber County**.

Table 4.179: Barber County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	80
Average Number of Claims per Year	8
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	33,851
Average Number of Acres Damaged per Year	3,385
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,948,324
Average Crop Damage per Year	$294,832

Source: USDA

According to the USDA Risk Management Agency, Barber County can expect on a yearly basis, relevant to winter storm occurrences:

- Eight insurance claims
- 3,385 acres impacted

- $294,832 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Barton County**.

Table 4.180: Barton County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	101
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	32,074
Average Number of Acres Damaged per Year	3,207
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,151,723
Average Crop Damage per Year	$215,172

Source: USDA

According to the USDA Risk Management Agency, Barton County can expect on a yearly basis, relevant to winter storm occurrences:

- Ten insurance claims
- 3,207 acres impacted
- $215,172 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Comanche County**.

Table 4.181: Comanche County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	35
Average Number of Claims per Year	4
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	21,103
Average Number of Acres Damaged per Year	2,110
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$1,226,660
Average Crop Damage per Year	$122,666

Source: USDA

According to the USDA Risk Management Agency, Comanche County can expect on a yearly basis, relevant to winter storm occurrences:

- Four insurance claims
- 2,110 acres impacted
- $122,666 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Edwards County**.

Table 4.182: Edwards County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	81
Average Number of Claims per Year	8
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	30,122
Average Number of Acres Damaged per Year	3,012
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,003,809
Average Crop Damage per Year	$300,381

Source: USDA

According to the USDA Risk Management Agency, Edwards County can expect on a yearly basis, relevant to winter storm occurrences:

- Eight insurance claims
- 3,012 acres impacted
- $300,381 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Kiowa County**.

Table 4.183: Kiowa County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	54
Average Number of Claims per Year	5
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	24,288
Average Number of Acres Damaged per Year	2,429
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,295,117
Average Crop Damage per Year	$229,512

Source: USDA

According to the USDA Risk Management Agency, Kiowa County can expect on a yearly basis, relevant to winter storm occurrences:

- Five insurance claims
- 2,429 acres impacted
- $229,512 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Pawnee County**.

Table 4.184: Pawnee County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	101
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	37,775
Average Number of Acres Damaged per Year	3,777
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,258,500

Table 4.184: Pawnee County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
Average Crop Damage per Year	$325,850

Source: USDA

According to the USDA Risk Management Agency, Pawnee County can expect on a yearly basis, relevant to winter storm occurrences:

- Ten insurance claims
- 3,777 acres impacted
- $325,850 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Pratt County**.

Table 4.185: Pratt County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	101
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	32,074
Average Number of Acres Damaged per Year	3,207
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,151,723
Average Crop Damage per Year	$215,172

Source: USDA

According to the USDA Risk Management Agency, Pratt County can expect on a yearly basis, relevant to winter storm occurrences:

- Ten insurance claims
- 3,207 acres impacted
- $215,172 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Stafford County**.

Table 4.186: Stafford County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	126
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	53,345
Average Number of Acres Damaged per Year	5,334
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,921,173
Average Crop Damage per Year	$392,117

Source: USDA

According to the USDA Risk Management Agency, Stafford County can expect on a yearly basis, relevant to winter storm occurrences:

- 13 insurance claims
- 5,334 acres impacted
- $392,117 in insurance claims

In addition, Kansas Region E has had seven Presidentially Declared Disasters relating to winter storms (and other concurrent events) in the last 20 years. This represents an average one declared winter storm related disaster per year.

4.22.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to winter storm events. Counties with a higher or increasing population, and/or a high or increasing structural valuation are to be considered to have a potentially greater vulnerability.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region E county (in total, due to the regional nature of both storms and NCEI reporting) incurring damage over the period 2009 to 2018 from winter storm events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

Table 4.187: Kansas Region E Structural Vulnerability Data for Winter Storms, 2009-2018

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Regional Counties	$7,413,602,000	$50,000	0.00%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to winter storm events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.188: Kansas Region E Population Vulnerability Data for Winter Storms

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region E County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of winter storms on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to winter storm events.

Table 4.189: Winter Storm Acres Impacted and Crop Insurance Paid per County from 2009-2018

Jurisdiction	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Barber	631,631	3,385	0.54%	$93,568,000	$294,832	0.32%
Barton	557,961	3,207	0.57%	$365,672,000	$215,172	0.06%
Comanche	453,556	2,110	0.47%	$51,803,000	$122,666	0.24%
Edwards	392,025	3,012	0.77%	$228,780,000	$300,381	0.13%
Kiowa	442,981	2,429	0.55%	$78,281,000	$229,512	0.29%
Pawnee	474,275	3,777	0.80%	$362,349,000	$325,850	0.09%
Pratt	465,191	3,207	0.69%	$271,307,000	$215,172	0.08%
Stafford	493,694	5,334	1.08%	$198,573,000	$392,117	0.20%

Source: USDA

4.22.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.190: Winter Storm Consequence Analysis

Subject	Impacts of Winter Storm
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the areas of snow and ice are expected to be severe if caught without proper shelter.
Health and Safety of Responders	Impacts will be predicated on the severity of the event. Damaged infrastructure will likely result in hazards such as downed utility lines, main breakages and debris on roadways. .
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage. Services may be limited to essential tasks if utilities are impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location and structural capacity of the facility. Loss of structural integrity of buildings and infrastructure could occur. Utility lines, roads, residential and business properties will be affected.
Environment	Impact could be severe for the immediate impacted area, depending on the size of the event. Impact will lessen as distance increases from the immediate incident area
Economic Conditions	Impacts to the economy will be dependent severity of the event and the impact on structures and infrastructure. Impacts could be severe if roads/utilities are affected.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. The timeliness warnings could be questioned.

4.23 – Civil Disorder

Civil disorder is a term that generally refers to a public disturbance by three or more people involving acts of violence that cause immediate danger, damage, or injury to others or their property. However, it is important to remember that gatherings in protest are recognized rights of any person or group, and this right is protected under the United States Constitution.

4.23.1 – Location and Extent

Historically civil disorder has been most commonly associated with urban areas and college campuses. And while the entire planning area may be affected by civil disorder, with its generally small population and low population density, the magnitude of such an event would likely be limited to the major cities within the region.

In general, civil unrest usually accompanies, or is started by, a gathering of people for an event. And while most events occur with no violence, violence can occur with little warning or cause. Unfortunately, large crowds can be subject to control by skillful troublemakers who are often able to incite behavior from members of the crowd that they usually would not consider. When a crowd begins to exhibit signs of disorder, it can be categorized in three categories:

- **Public disorder:** Public disorder is a basic breach of civic order. Individuals or small groups assembling have a tendency to disrupt the normal flow of things around them.
- **Public disturbance:** Public disturbance is designed to cause turmoil on top of the disruption. Individuals and groups assembling into a crowd begin chanting, yelling, singing, and voicing individual or collective opinions.
- **Riot:** A riot is a disturbance that turns violent. Assembled crowds become a mob that violently expresses itself by destroying property, assaulting others, and creating an extremely volatile environment.

While civil disorder is not an everyday occurrence in the planning area, when they do occur they are extremely disruptive and difficult to control. Should a civil disorder event occur in the planning area the result could be measured in loss of life, economic upheaval, and destruction of property.

4.23.2 – Previous Occurrences

There have been no documented cases of civil unrest of disorder in Kansas Region E during the past ten years.

4.23.3 – Hazard Probability Analysis

By nature, acts of civil disorder are difficult to foresee. However, the probability of a major civil disorder event in Kansas Region E is considered very low due the lack of any recent documented historical events. Again, it is worth noting that no previous occurrences in no way guarantees no future occurrences.

4.23.4 Vulnerability Analysis

Due to the unknown location and nature of civil disorder, all participating jurisdictions with Kansas Region E are vulnerable. Additionally, and again related to the capricious nature of civil disorder, all buildings and citizens are vulnerable.

Economic impacts and human injury or death are the primary concern with civil disorder. Increases in population or the hosting of major political, economic or social events could increase the likelihood and severity of a civil disturbance.

It is difficult to quantify potential losses of Civil Disorder due to the many variables and human elements and lack of historical precedence. Therefore, for the purposes of this plan, a **hypothetical scenario** is included for illustrative purposes only.

> **Event:** City organizers set up a two-block long fan zone near the local community sports field for an important sporting event. The population density in the fan zone is 6,000 people, with at least five persons per 25 square feet.
>
> **Riot:** The riot began to take shape as the game came to a close, with some spectators throwing bottles and other objects. Small fires were started and soon some rioters overturned a vehicle and set it alight. Fist fights broke out and in a nearby parking lot and two police cars were also set on fire. Riot police eventually managed to disperse the rioters and all fires were extinguished.
>
> **Results:** The following table presents potential event results:

Table 4.191: Hypothetical Riot Outcomes

Category	Result
Total Traumatic Injuries	250 persons
Total Urgent Care Injuries	1,000 persons
Injuries not Requiring Hospitalization	2,500 persons
Damage to Vehicles	Glass replacement cost for approximately 200 vehicles: $ 8,000 Repair / repainting cost for approximately 200 vehicles: $800,000
Damage to Buildings	Window replacement cost for approximately 50 buildings: $80,000

Source: Kansas State Hazard Mitigation Plan

4.23.5 – Impact and Consequence Analysis

As per EMAP standards, the following table provides the consequence analysis for drought conditions.

Table 4.192: Civil Disorder Consequence Analysis

Subject	Civil Disorder Potential Impacts
Health and Safety of the Public	Impact could be severe for persons in the incident area.
Health and Safety of Responders	Impact to responders could be severe if not trained and properly equipped. Responders that are properly trained and equipped will have a low to moderate impact.

Table 4.192: Civil Disorder Consequence Analysis

Subject	Civil Disorder Potential Impacts
Continuity of Operations	Depending on damage to facilities/personnel in the incident area, re-location may be necessary and lines of succession execution (minimal to severe).
Property, Facilities, and Infrastructure	Impact within the incident area could be severe, depending on the extent of the event. (minimal to severe)
Environment	Localized impact within the incident area could be severe depending on the type of human caused incident.
Economic Conditions	Economic conditions could be adversely affected and dependent upon time and length of clean up and investigation (minimal to severe).
Public Confidence in the Jurisdiction's Governance	Impact will be dependent on whether or not the incident could have been avoided by government or non-government entities, clean-up and investigation times, and outcomes. (minimal to severe).

4.24 – Hazardous Materials

Hazardous materials (HazMat) are any substances that pose a risk to health, life, or property when released or improperly handled. Generally, the term refers to materials with hazardous chemical or physical properties, though sometimes biological agents can fall under this category. The basic types of hazardous materials may be categorized according to more than six different systems; but the categories of U.S. Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11002) provide a general guide to hazardous materials:

- ***Extremely Hazardous Substances:*** Materials that have acutely toxic chemical or physical properties and may cause irreversible damage or death to people or harm the environment if released or used outside their intended use.
- ***Hazardous Substances:*** Materials posing a threat to human health and/or the environment, or any substance designated by the EPA to be reported if a designated quantity of the substance is spilled into waterways, aquifers, or water supplies or is otherwise released into the environment.

4.24.1 – Location and Extent

In Kansas Region E, HazMat incidents are generally classified as:

- **Fixed Facility Incidents:** Commercial Facilities and Superfund Sites
- **Transportation Incidents:** Highway, Railway, Pipeline, Air, and Water

Fixed Facilities

When facilities have hazardous materials in quantities at or above the threshold planning quantity, they must submit Tier II information to appropriate federal and state agencies to facilitate emergency planning in accordance with the Community Right to Know Act. The forms are known as Tier II reports and the facilities included are referred to as Tier II facilities. According to data provided by KDEM, there are 3,424 Tier II Facilities housing hazardous chemicals in Kansas Region E. The following table details the number of Tier II facilities by county.

Table 4.193: Kansas Region E Tier II Facilities by County

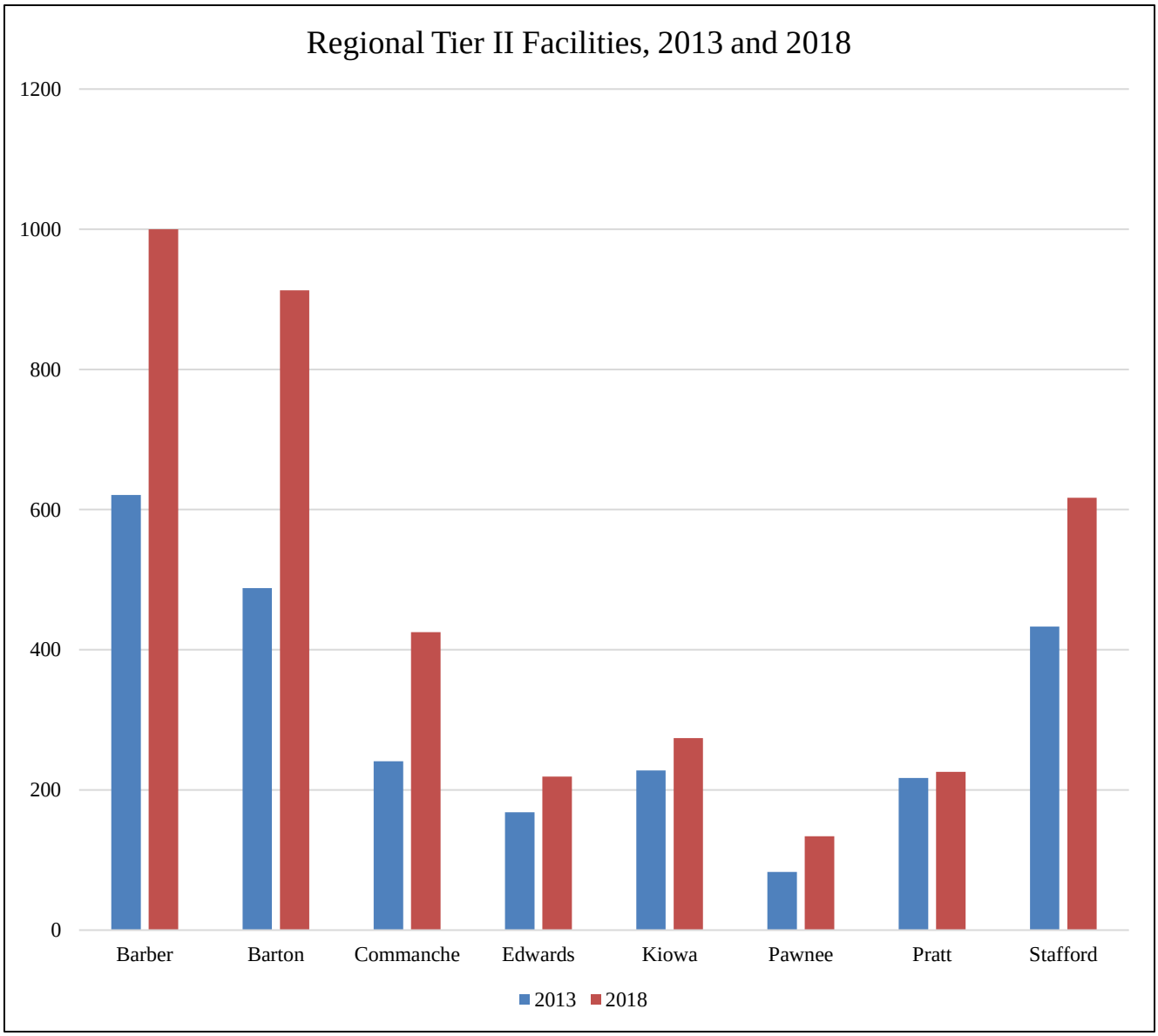
County	Tier II Facilities
Barber	1,000
Barton	913
Comanche	425
Edwards	219
Kiowa	274
Pawnee	134
Pratt	226

Table 4.193: Kansas Region E Tier II Facilities by County

County	Tier II Facilities
Stafford	617

Source: KDEM

As illustrated in the following graph, the number of Tier II facilities has increased for the region, primarily to due to an extensive outreach effort by KDHE to facilities that house hazardous chemicals



The National Priorities List (NPL) is a published list of hazardous waste sites in the country that are eligible for extensive, long-term cleanup under the Superfund program. A Superfund site is an uncontrolled or abandoned location where hazardous waste is located which may affect local ecosystems and/or people. The EPA has indicated that there are no Superfund sites located with Kansas Region K.

Transportation

The following table, from Kansas Department of Transportation (KDOT), presents total roadway mileage by county.

Table 4.194: Kansas Region E Total Roadway Mileage by County

County	Roadways (Miles)
Barber	1,034
Barton	1,921
Comanche	695
Edwards	1,071
Kiowa	904
Pawnee	1,427
Pratt	1,359
Stafford	1,481

Source: KDOT

Kansas Region E is served by numerous railroad companies. Railroads are generally defined by three classes, predicated on revenue and size, with Class I (Freight) being the largest. Class I railroads are of the greatest concern due to the type of freight carried, with categories including There are three Class I railroads in Kansas Region E providing service with long-haul deliveries to national market areas and intermodal rail/truck service providers:

- Burlington Northern and Santa Fe Railway
- Union Pacific
- Kansas and Oklahoma Railroad

The following table, with information from KDOT, provides the total railroad track mileage of for each county within Kansas Region E.

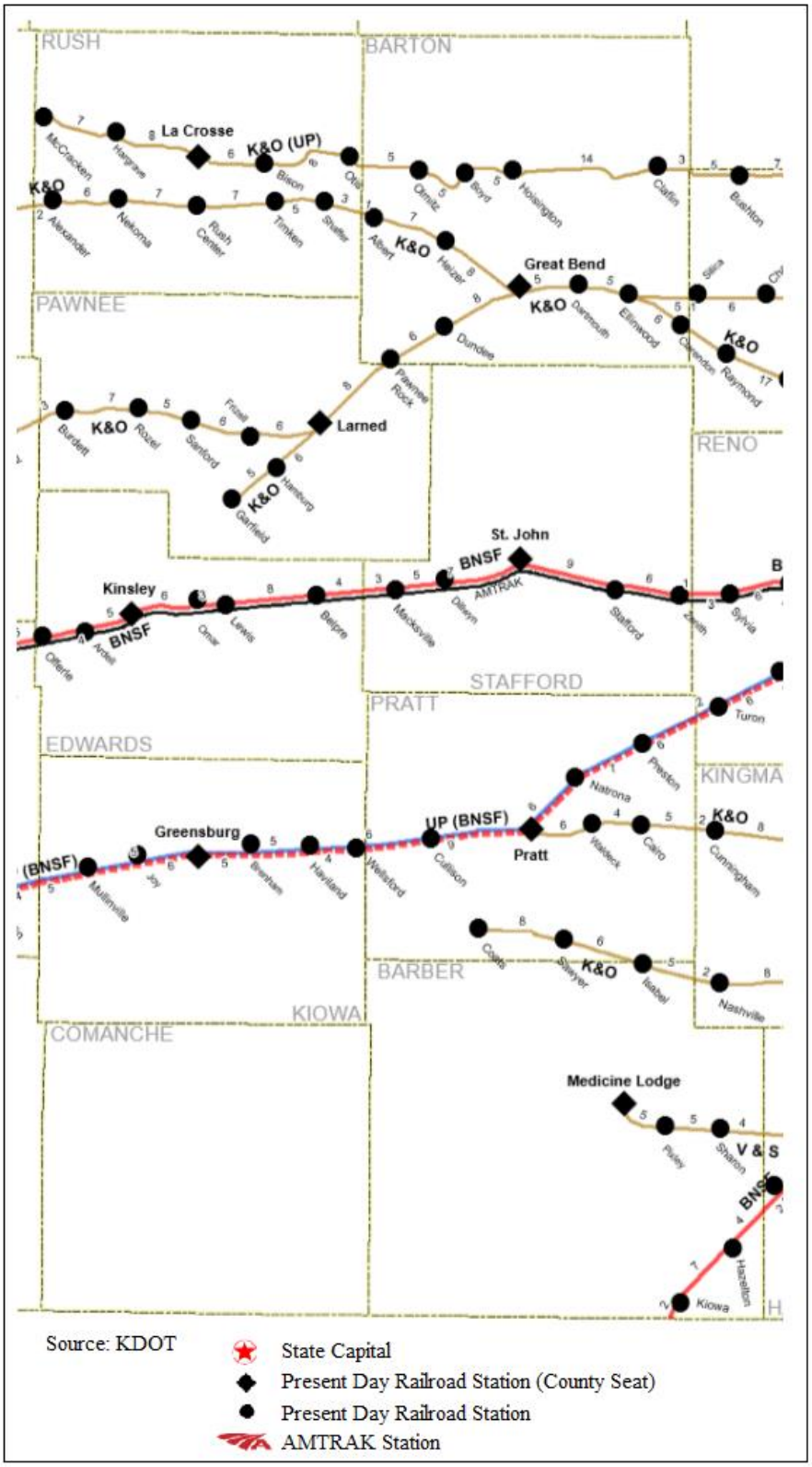
Table 4.195: Kansas Region E Total Class I Railroad Mileage by County

County	Interstates (Miles)
Barber	27
Barton	84
Comanche	0
Edwards	31
Kiowa	30
Pawnee	45
Pratt	65
Stafford	31

Source: KDOT

The following map, from KDOT, shows Class I track locations in Kansas Region E.

Regional Class I Railway Lines



Pipelines

The following data, provided by KDEM and the United States Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA), indicates the total number of gas and liquid pipeline mileage per county

Table 4.196: PHMSA Pipeline Mileage by County

County	Gas (miles)	Liquid (miles)
Barber	259	130
Barton	76	100
Comanche	214	60
Edwards	419	141
Kiowa	132	93
Pawnee	255	198
Pratt	188	6
Stafford	259	130

Source: KDEM and PHMSA

4.24.2 – Previous Occurrences

The following table, with data from KDEM, lists the number of hazardous materials incidents, injuries, fatalities and people evacuated from the public and facilities for each Kansas Region E county over the ten-year period 2009-2018.

Table 4.197: Kansas Region E HazMat KDEM Reported Incidents, 2009-2018

Jurisdiction	Incidents	Injuries	Fatalities	People Evacuated
Barber	1	0	0	0
Barton	2	0	0	0
Comanche	1	0	0	0
Edwards	0	0	0	0
Kiowa	3	0	0	0
Pawnee	0	0	0	0
Pratt	6	2	1	0
Stafford	4	0	0	0

Source: KDEM

Hazardous Materials Regulations (49 CFR Parts 171-180) require certain types of HazMat incidents be reported, with data tracked by PHMSA's Office of Hazardous Materials Safety (OHMS) by transportation category type (Air, Highway, Rail and Water). The OHMS Incident Report Database from 2010 to 2018 indicated 49 reported incidents within Kansas Region E for the period 2000 through 2018. The following charts detail the number of events per year per transportation category.

Table 4.198: Kansas Region E OHMS HazMat Incidents, 2000-2018

Jurisdiction	Highway	Air	Rail	Damages	Injuries	Deaths
Barber County						
Isabel	2	0	0	$0	0	0
Medicine Lodge	1	0	0	$50,000	0	0
Barton County						
Ellinwood	1	0	0	$0	0	0
Great Bend	7	0	0	$1,139	0	0
Susank	1	0	0	$200,100	0	0
Comanche County						
Coldwater	1	0	0	$0	0	0
Edwards County						
-	-	-	-	-	-	-
Kiowa County						
-	-	-	-	-	-	-
Pawnee County						
-	-	-	-	-	-	-
Pratt County						
Cullison	1	0	0	$92,000	0	0
Pratt	2	0	0	$9,000	3	0
Stafford County						
-	-	-	-	-	-	-

Source: PHMSA OHMS
-: No reported events

Data from PHMSA provides significant incident reports for the pipeline systems in Kansas Region E. Data from the period 2013 to 2017 indicate that there were ten pipeline incidents that no fatalities, no injuries and $2,209,467 in damages. The following table details reported pipeline incident details for each county with a reported event.

Table 4.199: Kansas Region E PHMSA Reported Pipeline Incidents by County, 2013 to 2017

County	Number of Incidents	Fatalities	Injuries	Total Damage	Gross Barrels Spilled
Barber	1	0	0	$3,350	2
Barton	4	0	0	$125,927	4
Comanche	-	-	-	-	-
Edwards	0	0	0	$0	0
Kiowa	2	0	0	$38,211	16
Pawnee	-	-	-	-	-
Pratt	2	0	0	$473,701	38
Stafford	4	0	0	$124,158	860

Source: PHMSA
-: No reported events

4.24.3 – Hazard Probability Analysis

HazMat incidents are not predictable. However, probabilities can be estimated using past occurrence data as a guide.

The following tables summarize occurrence data and probability for HazMat events for **Barber County** using data from KDEM.

Table 4.200: Barber County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	1
Average Events per Year	<1
Number of Reported Injuries (2013-2015)	0
Average Injuries per Year	0
Number of Reported Deaths (2013-2015)	0
Average Deaths per Year	0
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Barber County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- <1 event
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for HazMat events for **Barton County** using data from KDEM.

Table 4.201: Barton County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	2
Average Events per Year	<1
Number of Reported Injuries (2013-2015)	0
Average Injuries per Year	0
Number of Reported Deaths (2013-2015)	0
Average Deaths per Year	0
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Barton County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- <1 event

- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for HazMat events for **Comanche County** using data from KDEM.

Table 4.202: Comanche County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	1
Average Events per Year	<1
Number of Reported Injuries (2013-2015)	0
Average Injuries per Year	0
Number of Reported Deaths (2013-2015)	0
Average Deaths per Year	0
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Comanche County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- <1 event
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for HazMat events for **Edwards County** using data from KDEM.

Table 4.203: Edwards County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	0
Average Events per Year	0
Number of Reported Injuries (2013-2015)	0
Average Injuries per Year	0
Number of Reported Deaths (2013-2015)	0
Average Deaths per Year	0
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Edwards County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- No events
- No deaths

- No injuries
- No evacuations

The following tables summarize occurrence data and probability for HazMat events for **Kiowa County** using data from KDEM.

Table 4.204: Kiowa County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	3
Average Events per Year	1
Number of Reported Injuries (2013-2015)	0
Average Injuries per Year	0
Number of Reported Deaths (2013-2015)	0
Average Deaths per Year	0
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Kiowa County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- One event
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for HazMat events for **Pawnee County** using data from KDEM.

Table 4.205: Pawnee County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	0
Average Events per Year	0
Number of Reported Injuries (2013-2015)	0
Average Injuries per Year	0
Number of Reported Deaths (2013-2015)	0
Average Deaths per Year	0
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Pawnee County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- No events
- No deaths
- No injuries

- No evacuations

The following tables summarize occurrence data and probability for HazMat events for **Pratt County** using data from KDEM.

Table 4.206: Pratt County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	6
Average Events per Year	2
Number of Reported Injuries (2013-2015)	2
Average Injuries per Year	<1
Number of Reported Deaths (2013-2015)	1
Average Deaths per Year	<1
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Pratt County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- Two events
- <1 death
- <1 injury
- No evacuations

The following tables summarize occurrence data and probability for HazMat events for **Stafford County** using data from KDEM.

Table 4.207: Stafford County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2013-2015)	4
Average Events per Year	1
Number of Reported Injuries (2013-2015)	0
Average Injuries per Year	0
Number of Reported Deaths (2013-2015)	0
Average Deaths per Year	0
Number of Reported Evacuations (2013-2015)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Stafford County can expect on a yearly basis, relevant to fixed facility related HazMat events:

- One event
- No deaths
- No injuries
- No evacuations

4.24.4 – Vulnerability Analysis

Special populations are particularly vulnerable to the impacts of a hazardous materials incident because of the potential difficulties involved in the evacuation. The following table details the number of special population facilities in each Kansas Region E county located within ½ mile of a chemical facility. The locations of colleges, educational and correctional institution facilities is from the Kansas Data Access & Support Center, health facilities data is from HAZUS, aging facilities is from KDEM and childcare facilities is from KDHE.

Table 4.208: Kansas Region E Special Population Facilities Within

County	Health Facilities	Colleges	Educational Facilities	Aging Facilities	Child Care	Correctional Institutions
Barber	1	0	4	1	14	1
Barton	1	0	14	6	72	1
Comanche	1	0	3	1	8	0
Edwards	1	0	2	1	3	1
Kiowa	1	1	8	2	5	1
Pawnee	0	0	8	2	18	1
Pratt	0	0	5	2	25	1
Stafford	1	0	2	1	3	0

Source: KDEM

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to HazMat events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.209: Kansas Region E Population Vulnerability Data for HazMat

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

4.24.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.210: HazMat Incident Consequence Analysis

Subject	Impacts of Hazardous Materials Incident
Health and Safety of Persons in the Area of the Incident	Impact in the immediate area could be severe and long lasting.

Table 4.210: HazMat Incident Consequence Analysis

Subject	Impacts of Hazardous Materials Incident
Responders	Impact to responders is expected to be moderate to severe, potentially even with required safety equipment.
Continuity of Operations	Long term relocation may be necessary if government facilities experience contamination or damage.
Property, Facilities, and Infrastructure	Localized impact could be severe in the incident area. Facilities may need to be abandoned and razed. Large areas may become inaccessible.
Environment	Impact could be severe for the immediate area. Impact will lessen with distance. The proximity of open bodies of water could compound the impact.
Economic Conditions	Local economy and finances may be adversely affected, depending on the nature, extent and duration of the event.
Public Confidence in Governance	Response and recovery will be in question if not timely and effective. Warning systems and the timeliness of those warnings could be questioned.

4.25 – Major Disease

For this plan, major disease is classified as infectious diseases caused by microscopic agents, including viruses, bacteria, parasites, and fungi or by their toxins, that may impact humans. They may be spread by direct contact with an infected person or animal, ingesting contaminated food or water, vectors such as mosquitoes or ticks, contact with contaminated surroundings such as animal droppings, infected droplets, or by aerosolization.

4.25.1 – Location and Extent

Human transmissible disease and infectious diseases are illnesses caused by microscopic agents, including viruses, bacteria, parasites, and fungi or by their toxins. They may be spread by direct contact with an infected person or animal, ingesting contaminated food or water, vectors such as mosquitoes or ticks, contact with contaminated surroundings such as animal droppings, infected droplets, or by aerosolization.

The entire planning area is susceptible to a transmissible disease outbreak. However, more densely populated areas may be more susceptible.

4.25.2 – Previous Occurrences

The KDHE was contacted concerning the epidemiological tracking of contagious and/or human transmissible diseases. Data was solicited concerning the following diseases of concern:

- Haemophilus Influenzae Invasive Disease
- Measles (Rubeola)
- Meningococcal Infections
- Mumps
- Pertussis
- Streptococcus pneumoniae, Invasive
- West Nile Virus
- Zika Virus

A review of available data indicates there have been no unusual or concerning spikes in these diseases. Additionally, no new novel pathogens of concern have been tracked or reported.

4.25.3 – Hazard Probability Analysis

Each year the Centers for Disease Control (CDC) produces a report detailing the legally reportable diseases in the United States. While over time this report can serve as a predictor of the likelihood of future disease, it is impossible to predict outbreaks. However, data from the CDC report does not indicate any areas of concern for Kansas Region E. Based on the relatively limited/controlled outbreak history and population density factors in Kansas Region E, the possibility of a large-scale major disease outbreak to be limited.

4.25.4 – Vulnerability Analysis

For purposes of this assessment, no facilities or agricultural commodities are considered vulnerable to the major disease hazard.

Due to the person to person transmission of many diseases of concern counties with a higher identified population are to be considered to have a potentially greater vulnerability. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.211: Kansas Region E Population Vulnerability Data for Major Disease

County	2018 Population	Percent Population Change 2000 to 2018
Barber	4,472	-15.7%
Barton	26,111	-7.4%
Comanche	1,748	-11.1%
Edwards	2,849	-17.4%
Kiowa	2,516	-23.2%
Pawnee	6,562	-9.3%
Pratt	9,378	-2.8%
Stafford	4,178	-12.8%

Source: US Census Bureau

Additionally, there is an increased likelihood of mortality for very young and very old populations due to transmissible disease. The following table indicates the percentage of the total county population that may be considered especially vulnerable to a major disease.

Table 4.212: Kansas Region E Vulnerable Population Vulnerability Data for Major Disease

County	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)
Barber	6.1%	23.0%
Barton	6.3%	19.2%
Comanche	4.9%	25.6%
Edwards	6.0%	21.3%
Kiowa	6.7%	21.9%
Pawnee	6.4%	22.2%
Pratt	7.0%	20.2%
Stafford	4.1%	21.0%

Source: US Census Bureau

4.25.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.213: Major Disease Consequence Analysis

Subject	Impacts of Major Disease Outbreak
Health and Safety of Persons in the Area of the Incident	Impact over a widespread area could be severe depending on type of outbreak and whether it is a communicable disease. Casualties are dependent on warning systems, warning times and the availability of vaccines, antidotes, and medical svc.
Responders	Impact to responders could be severe, especially if they reside in the area and or their type of exposure during response. With proper precautions and safety nets in place the impact is lessened.
Continuity of Operations	Continuity of Operations will be greatly dependent on availability of healthy individuals. COOP is not expected to be exercised.
Property, Facilities, and Infrastructure	Access to facilities and infrastructure could be affected until decontamination is completed
Environment	Impact could be severe for the immediate impacted area depending on the source of the outbreak. Impact could have far-reaching implications if disease is transferable between humans and animals or to wildlife.
Economic Conditions	Impacts to the economy could be severe if the disease is communicable. Loss of tourism, revenue, and business as usual will greatly affect the local economy and the state as a whole.
Public Confidence in Governance	Response and recovery will be in question if not timely and effective. Availability of medical supplies, vaccines, and treatments will come into question.

4.26 – Radiological Incident

For purposes of this plan, a radiological incident is considered an accident involving a release of radioactive materials from a nuclear reactor. Radiological accidents could cause injury or death, contaminate property and valuable environmental resources, as well as disrupt the functioning of communities and their economies. Since 1980, each utility that owns a commercial nuclear power plant in the United States has been required to have both an onsite and offsite emergency response plan as a condition of obtaining and maintaining a license to operate that plant. Onsite emergency response plans are approved by the U.S. Nuclear Regulatory Commission (NRC).

4.26.1 – Location and Extent

The only active commercial nuclear reactor within the State of Kansas is the Wolf Creek Nuclear Power Plant (Wolf Creek) in Coffey County. Kansas Region E is well outside of both the 10-mile 50-mile emergency planning zones for Wolf Creek. The entire planning region is at risk from a radiological event due to transportation accidents.

4.26.2 – Previous Occurrences

There have been no reported major radiological events recorded in Kansas Region E.

4.26.3 – Hazard Probability Analysis

There have been no reported nuclear failure and/or release events in Kansas Region E.

4.26.4 – Vulnerability Assessment

The major usage of radioactive materials in the region are for medical diagnostics and therapy, soil density testing in the construction industry, and in radiography cameras in pipeline construction and repair. During all lawful operations of radioactive materials, the licensee is responsible for ensuring that the area around the source material is cordoned off or shielding is used to prevent unnecessary exposures. Inspections of practices and security measures are regularly conducted to ensure compliance and conformity to regulations in order to protect the public. The frequency of inspections can be adjusted in response to perceived risk. Public risk can be reduced by minimizing the duration of exposure, shielding the source material and maximizing the distance from the source.

It is common for materials, including pharmaceuticals, industrial sources and nuclear fuel rods destined to nuclear reactors, to be transported via highways and railroads. Areas near interstates and major highways have an increased risk of transportation accidents. Remote areas also have to account for long response times from hazardous materials and health physics personnel.

4.26.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.214: Radiological Incident Consequence Analysis

Subject	Impacts of Nuclear Incident
Health and Safety of Persons in the Area of the Incident	Impact in the immediate area could be severe and long lasting.
Responders	Impact to responders is expected to be severe, potentially even with required safety equipment.
Continuity of Operations	Long term relocation may be necessary if government facilities experience contamination.
Property, Facilities, and Infrastructure	Localized impact could be severe in the incident area. Facilities may need to be abandoned and razed. Large areas may become inaccessible.
Environment	Impact could be severe for the immediate area. Impact will lessen with distance.
Economic Conditions	Local economy and finances may be adversely affected, depending on the nature, extent and duration of the event.
Public Confidence in Governance	Response and recovery will be in question if not timely and effective. Warning systems and the timeliness of those warnings could be questioned.

4.27 – Terrorism

The United States does not have a standardized definition of terrorism that is agreed upon by all agencies. The Federal Bureau of Investigation generally defines terrorism 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."

4.27.1 – Location and Extent

Kansas is home to a wide variety of criminal extremist groups. The Southern Poverty Law Center reported that in 2018 there were three active hate groups in Kansas: one neo-Nazi group, the National Socialist Movement in Lansing, one racist skinhead group, the Midland Hammerskins in Wichita, and one anti-homosexual group, the Westboro Baptist Church in Topeka. Other groups, such as the Animal Liberation Front, Earth Liberation Front, and People for the Ethical Treatment of Animals may have sympathizers in the region. Although no major terrorist acts have been attributed to any of these latter groups, their involvement in violent acts is meant to disrupt governmental functions and cannot be discounted.

4.27.2 – Previous Occurrences

Kansas Region E has been fortunate to escape a major terrorist incident.

4.27.3 – Hazard Probability Analysis

By nature, acts of terrorism are difficult to foresee. However, the probability of a major terrorist event in Kansas Region E is considered very low due the lack of any documented historical events. Again, it is worth noting that no previous occurrences in no way guarantees no future occurrences.

4.27.4 – Vulnerability Analysis

For purposes of this assessment, data is not available to quantify vulnerability or estimated losses as a result of terrorism incidents that might impact state-owned facilities.

For this assessment, it is not possible to calculate a specific vulnerability for each county or participating jurisdiction. However, because of the desire for publicity following attacks, it is more likely that counties and jurisdictions with greater population densities and /or larger evet venues have a greater risk.

It is difficult to quantify potential losses of terrorism due to the many variables and human elements and lack of historical precedence. Therefore, for the purposes of this plan, the loss estimates will take into account three hypothetical scenarios. The estimated impact of each event was calculated using the Electronic Mass Casualty Assessment and Planning Scenarios developed by Johns Hopkins University.

Please note that the hypothetical scenarios are included for illustrative purposes only.

Scenario #1: Mustard Gas Release

Event: Mustard gas is released from a light aircraft onto the stadium during a home football game. The agent directly contaminates the stadium and the immediate surrounding area. This attack would cause harm to humans and could render portions of the stadium unusable for a short time period in order to allow for a costly clean-up. There might also be a fear by the public of long-term contamination of the stadium and subsequent boycott of games resulting in a loss of revenue and tourism dollars.

Event Assumptions: For this scenario the number of people in the stadium is 50,000 with an additional 5,000 persons remain outside the stadium in the adjacent parking areas. The agent used, mustard gas, is extremely toxic and may damage eyes, skin and respiratory tract with death sometimes resulting from secondary respiratory infections. Death rate from exposure estimated to be 3%. The estimated decontamination cost is $12 person. For this scenario it is assumed that all persons with skin injuries will require decontamination.

Results: The following table presents the estimated human and economic impacts of the scenario.

Table 4.215: Estimated Impact of Scenario #1, Mustard Gas Release

Impact	Post Exposure Onset Time	Effect
Severe Eye Injuries (1-2 hours)	1 -2 Hours	41,250 persons
Severe Airway Injuries (1-2 hours)	1 - 2 Hours	41,250 persons
Severe Skin Injuries (2 hours to days)	2 Hours to Days	49,500 persons
Deaths	Immediate to Days	1,100 persons
Cost of Decontamination	N/A	$594,000

Source: Electronic Mass Casualty Assessment and Planning Scenarios by Johns Hopkins University

Scenario #2: Pneumonic Plague

Event: Four Canisters containing aerosolized pneumonic plague bacteria are opened in public bathrooms of heavily populated buildings (airports, stadiums, etc.). Each release location will directly infect 110 people; hence, the number of release locations dictates the initial infected population. The secondary infection rate is used to calculate the total infected population. This attack method would not cause damages to buildings or other infrastructure, only to human populations.

Event Assumptions: Each canister contains 650 milliliters of pneumonic plague bacteria. The type of infectious agent used is identified on Day 4. After identification, the fatality rate is 10% for new cases. Pneumonic plague has a 1-15 percent mortality rate in treated cases and a 40-60 percent mortality rate in untreated cases.

Results: The following table presents the estimated human impacts of the scenario.

Table 4.216: Estimated Impact of Scenario #2, Pneumonic Plague Release

Impact	Effect
Initial Infected Population	440 persons
Secondary Infected Population	883 persons
Deaths (7% of Infected)	62

Source: Electronic Mass Casualty Assessment and Planning Scenarios by Johns Hopkins University

Scenario #3: Improvised Explosive Device

Event: An improvised explosive device utilizing an ammonium nitrate/fuel oil mixture is carried in a panel van to a parking area during a time when stadium patrons are leaving their cars and entering the stadium and detonated. Potential losses with this type of scenario include both human and structural assets.

Event Assumptions: The quantity of ammonium nitrate/fuel oil mixture used is 4,000 pounds. The population density of the lot is assumed to be 1 person per every 25 square feet for a pre-game crowd. The Lethal Air Blast Range for such a vehicle is estimated to be 50 feet according to the Bureau of Alcohol, Tobacco, Firearms and Explosives Standards. The Falling Glass Hazard distance is estimated at 600 feet according to Bureau of Alcohol, Tobacco, Firearms and Explosives Explosive Standards. In this event, damage would occur to vehicles, and depending on the proximity of other structures, damages would occur to the stadium complex itself. The exact amount of these damages is difficult to predict because of the large numbers of factors, including the type of structures nearby and the amount of insurance held by vehicle owners. It is estimated that the average replacement cost for a vehicle is $20,000 and the average repair cost for damaged vehicles would be $4,000.

Results: The following table presents the estimated human impacts of the scenario.

Table 4.217: Estimated Impact of Scenario #3, Improvised Explosive Device

Impact	Effect
Deaths	1,391 persons
Trauma Injuries	2,438 persons
Urgent Care Injuries	11,935
Injuries not Requiring Hospitalization	4,467
Repair Costs for 100 Vehicles	$400,000
Replacement Costs for 50 Vehicles	$1,000,000

Source: Electronic Mass Casualty Assessment and Planning Scenarios by Johns Hopkins University

4.27.5 – Impact and Consequence Analysis

There is no consensus on estimates of potential fatalities and injuries for terrorism events. Injury and death tolls would be dependent on the type, size and weapon used. Areas with higher population densities would likely result in a greater number of casualties.

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.218: Terrorism Consequence Analysis

Subject	Impacts of Terrorism
Health and Safety of Persons in the Area of the Incident	Impact could be severe for persons in the incident area.
Responders	Impact to responders could be severe if not trained and properly equipped. Responders that are properly trained and equipped will have a low to moderate impact.
Continuity of Operations	Depending on damage to facilities/personnel in the incident area, relocation may be necessary and lines of succession execution.
Property, Facilities, and Infrastructure	Impact within the incident area could be severe for explosion, moderate to low for Hazmat.
Environment	Localized impact within the incident area could be severe depending on the type of incident.
Economic Conditions	Economic conditions could be adversely affected and dependent upon time and length of clean up and investigation.
Public Confidence in Governance	Impact dependent on if the incident could have been avoided by government entities, clean-up, investigation times and outcomes.

4.28 – Utility/Infrastructure Failure

Critical infrastructure involves several different types of facilities and systems including:

- Electric power
- Transportation routes
- Natural gas and oil pipelines
- Water and sewer systems, storage networks
- Internet/telecommunications systems

Failure of utilities or infrastructure components in south-southwest Kansas can seriously impact public health, functioning of communities and the region's economy. Disruptions to utilities can occur from many of the hazards detailed in this plan, but the most likely causes include:

- Floods
- Lightning
- Tornados and Windstorms
- Winter Storms

In addition to being impacted by another listed hazard, utilities and infrastructure can fail as a result of faulty equipment, lack of maintenance, degradation over time, or accidental damage.

4.28.1 – Location and Extent

All of Kansas Region E is at risk for utility and/or infrastructure failure. The following sections discuss the major utilities in further detail.

Electric Power

The most common hazards analyzed in this plan that may disrupt the power supply are flood, lightning, tornado, windstorm, and winter weather. In addition, extreme heat can disrupt power supply when air conditioning use spikes during heat waves resulting in brownouts or rolling blackouts.

In general, electricity in Kansas Region E is provided by either investor-owned utilities or rural electric cooperatives (RECs). RECs are not-for-profit, member-owned electric utilities. Kansas RECs are governed by a board of trustees elected from the membership. Most Kansas RECs were set up under the Kansas Electric Cooperative Act, which, together with the federal Rural Electrification Act of 1934, made electric power available to rural customers. Information on regional electrical suppliers may be found at www.kec.org/servicearea_map.html. Additionally, locations of electric certified areas and transmission lines may be found at www.kcc.state.ks.us/maps/ks_electric_certified_areas.pdf.

Transportation Routes

Transportation routes can also be impacted by many of the hazards discussed in this plan. The primary hazards that impact transportation are flood, hazardous materials, and winter weather. Flood events can make roads and bridges impassible due to high water. Flood waters can also erode or scour roadbeds and bridge abutments. Highway and railroad accidents that involve hazardous materials can impact transportation routes through closures and/or evacuations. Winter weather frequently impacts transportation as roads become treacherous or impassible due to ice and snow. Other hazards that impact transportation routes include dam and levee failures if routes are in inundation areas, extreme temperatures that can cause damage to pavement, land subsidence that can damage roads/railroads, landslides that can cause debris and rock falls onto roadways, terrorism that can target routes, tornados that can directly damage infrastructure or deposit debris in routes, wildfires that can cause decreased visibility on transportation routes due to smoke, and windstorms that can cause vehicle accidents or overturning.

Pipelines Systems

Hazards that can impact natural gas and oil pipelines include earthquakes, expansive soils, land subsidence, landslide, and terrorism

Water and Sewer Systems

The primary hazards that can impact water supply systems include drought, floods, hazardous materials, and terrorism. Water district boundary maps are available for review at https://krwa.net/ONLINE-RESOURCES/RWD-Maps.

Internet and Telecommunications

Internet and telecommunications infrastructure can be impacted by floods, lightning, tornados, windstorms, and winter weather. Land line phone lines often utilize the same poles as electric lines, so when weather events such as windstorm or winter weather cause lines to break both electricity and telephone services may experience outages. With the increasing utilization of cellular phones, hazard events such as tornado that can damage cellular repeaters can cause outages. In addition, during any hazard event, internet and telecommunications systems can become overwhelmed due to the surge in call and usage volume. A map indicating telephone service providers in Kansas Region E is available at www.kcc.state.ks.us/maps /ks_telephone_certified_areas.pdf.

4.28.3 – Hazard Probability Analysis

Minor utility failures occur annually across the region, with larger failures usually tied to other disaster events such as tornados, winter storms and windstorms. As discussed throughout this plan, these concurrent events occur regularly. As such, it is expected that occasional, and largely concurrent utility failure events will occur.

4.28.4 – Vulnerability Assessment

Regionally, smaller utility suppliers generally have limited resources for mitigation. Thus, the large number of small utility service providers could mean greater vulnerability in the event of a major, widespread disaster, such as a major flood, severe winter storm or ice storm.

In recent years, regional electric power grid system failures in the western and east-central United States have demonstrated that similar failures could happen in Kansas Region E. This vulnerability is most appropriately addressed on a multi-state regional or national basis.

Since utility/infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc.

Although the limitless variables make it difficult to estimate future losses on a statewide basis, FEMA has developed standard loss of use estimates in conjunction with their Benefit-Cost Analysis methodologies to estimate the cost of lost utilities on a per-person, per-use basis.

Table 4.219: FEMA Benefit-Cost Analysis

Loss of Electric Power	Cost of Complete Loss of Service
Total Economic Impact	$131 per person per day
Loss of Potable Water Service	Cost of Complete Loss of Service
Total Economic Impact	$103 per person per day
Loss of Wastewater Service	Cost of Complete Loss of Service
Total Economic Impact	$45 per person per day
Loss of Road/Bridge Service	Cost of Complete Loss of Service
Vehicle Delay Detour Time	$29.63 per vehicle per hour (one-way trips)
Vehicle Delay Mileage	$0.54 per mile (or current federal mileage rate)

Source: FEMA BCA Reference Guide, June 2009, Appendix C

4.28.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.220: Utility/Infrastructure Failure Consequence Analysis

Subject	Impacts of Utility/Infrastructure Failure
Health and Safety of Persons in the Area of the Incident	Localized impact will be moderate to severe for persons with special needs and the elderly, depending on length of failure and time of year.
Responders	Impact to responders will be minimal if properly trained and equipped.
Continuity of Operations	Due to the nature of the hazard, the COOP plan is not expected to be activated. however, if the recovery time is excessive than temporary relocation may become necessary.
Property, Facilities, and Infrastructure	Impact is dependent on the nature of the incident, e.g., electric, water, sewage, gas, communication disruptions.
Environment	Impact, depending on the nature of the incident, should be minimal.
Economic Conditions	Economic conditions could be adversely affected depending on damages suffered, extent of damages, etc.

Table 4.220: Utility/Infrastructure Failure Consequence Analysis

Subject	Impacts of Utility/Infrastructure Failure
Public Confidence in Governance	Impact will be dependent on whether or not the government or non-government entities response, recovery, and planning were not timely and effective.

5.0 Capability Assessment

5.1 – Introduction

44 CFR 201.6 does not require a capability assessment to be completed for local hazard mitigation plans. However, 201.6(c)(3) states "A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools."

This section of the plan discusses the current capacity of regional communities to mitigate the effects of identified hazards. A capability assessment is conducted to determine the ability of a jurisdiction to execute a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

A capability assessment helps to determine which mitigation actions are practical based on a jurisdiction's fiscal, staffing and political resources. A capability assessment consists of:

- An inventory of relevant plans, ordinances, or programs already in place
- An analysis capacity to carry them out.

A thoughtful review of jurisdictional capabilities will assist in determining gaps that could limit current or proposed mitigation activities, or potentially aggravate a jurisdictions vulnerability to an identified hazard. Additionally, a capability assessment can detail current successful mitigation actions that should continue to receive support.

For this plan each participating jurisdiction was given an opportunity to present their capability assessment information.

5.2 – Granted Authority

In implementing a mitigation plan or specific action, a local jurisdiction may utilize any or all of the four broad types of government authority granted by the State of Kansas. The four types of authority are defined as:

- Regulation
- Acquisition
- Taxation
- Spending

Regulation

The scope of this local authority is subject to constraints, however, as all of Kansas' political subdivisions must not act without proper delegation from the State. Under a principle known as "Dillon's Rule," all power is vested in the State and can only be exercised by local governments to the extent it is delegated.

Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazard-proofing" a particular piece of property or area is to acquire the property, thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Kansas legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain (County Home Rule Powers, K.S.A. 19-101, 19-101a, 19-212).

Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Kansas law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood control within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development.

Spending

The Kansas General Assembly allocated the ability to local governments to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption of annual budgets and a Capital Improvement Plan. A Capital Improvement Plan is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A Capital Improvement Plan that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the Capital Improvement Plan is effective in directing growth away from environmentally sensitive or high hazard areas.

5.3 – Governance

All counties within Kansas Region E operate under a county commissioner form of governance, with the elected board of commissioners overseeing county operations.

Table 5.1: County Governance

Jurisdiction	Government Structure	Number of Commissioners
Barber County	Commission	3
Barton County	Commission	5
Comanche County	Commission	3
Edwards County	Commission	3
Kiowa County	Commission	3
Pawnee County	Commission	3
Pratt County	Commission	3
Stafford County	Commission	3

In general, the participating towns and cities in Kansas Region E operate either under a Mayoral form of governance or an elected city council form of governance.

5.4 – Jurisdictional Capabilities

Information as to the current capacity of participating jurisdictions is summarized in the following sections and tables. All capability information was provided by jurisdictional officials through the above referenced questions and through outreach from the MPC.

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Many smaller jurisdictions have very limited to no planning, management, response or mitigation capabilities. Often these jurisdictions rely on the county or nearby larger municipalities for assistance. This lack of capabilities is reflected in the following tables. Additionally, many very small or extremely limited participating small jurisdictions, largely townships, are not listed on the capability list. This in no way diminishes the participation in the process of these jurisdictions. Finally, special district capabilities are included in their overarching jurisdiction.

5.4.1 – Jurisdictional Planning Capabilities

The planning capability assessment is designed to provide a general overview of the key planning and regulatory tools or programs in place or under development. This information helps identify opportunities

to address existing planning gaps and provides an opportunity to review areas that mitigation planning actions can be utilized with existing plans. Jurisdictions were asked if they had completed the following plans:

Comprehensive Plan: A comprehensive plan establishes the overall vision for a jurisdiction and serves as a guide to decision making, and generally contains information on demographics, land use, transportation, and facilities. As a comprehensive plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.

Critical Facilities Plan: A critical facilities plan is used to identify a jurisdiction's critical facilities, including fire stations, police stations, hospitals, schools, day care centers, senior care facilities, major roads and bridges, critical utility sites, and hazardous material storage areas. Additionally, this plan may be used to determine methods to mitigate damage to these facilities.

Debris Management Plan: A debris management plan covers the response and recovery from debris-causing incidents such as tornados or floods. Planning considerations include debris removal and disposal, disposal locations, equipment availability, and personnel training.

Emergency Operations Plan: An emergency operations plan outlines responsibility, means and methods by which resources are deployed during and following an emergency or disaster.

Evacuation Plan: A plan that outlines routes and methods by which populations are evacuated during and following an emergency or disaster.

Fire Mitigation Plan: A fire mitigation plan is used to mitigate a jurisdictions wildfire risk and vulnerability. The plan documents areas with an elevated risk of wildfires, and identifies the actions taken to decrease the risk. A fire mitigaion plan can influence and prioritize future funding for hazardous fuel reduction projects, including where and how federal agencies implement fuel reduction projects on federal lands.

Flood Mitigation Assistance Plan: The purpose of the flood mitigation assistance plan is to reduce or eliminate the long-term risk of flood damage to buildings and other structures insured under the NFIP.

Recovery Plan: A disaster recovery plan guides the recovery and reconstruction process following a disaster. Hazard mitigation principles should be incorporated into disaster recovery plans to assist in breaking the cycle of disaster loss.

Vulnerable Population Plan and/or Inventory: A vulnerable populations plan is used to develop a strategic approach for support to persons with functional or special needs before, during and following a disaster.

The table below summarizes relevant jurisdictional planning capabilities.

Table 5.2: Jurisdictional Planning Capabilities

Jurisdiction	Comprehensive Plan	Critical Facilities Plan	Debris Management Plan	Emergency Operations Plan	Evacuation Plan	Firewise or other Fire Mitigation Plan	Flood Mitigation Assistance Plan	Recovery Plan	Vulnerable Population Plan or Inventory
Barber County			x	x		x			
City of Hardtner				x					
City of Hazelton				x					
City of Isabel				x					
City of Kiowa	x			x					
City of Medicine Lodge				x					
City of Sharon				x					
City of Sun City				x					
Barton County	x		x	x					
City of Albert				x					
City of Claflin			x	x	x	x	x		
City of Ellinwood	x			x					
City of Galatia				x					
City of Great Bend	x		x	x		x			
City of Hoisington	x			x			x		
City of Olmitz				x					
City of Pawnee Rock				x					
City of Susank				x					
Comanche County	x		x	x					
City of Coldwater				x					
City of Protection				x					
City of Wilmore				x					
Edwards County	x		x	x					
City of Belpre				x					
City of Kinsley	x			x					
City of Lewis				x					
City of Offerle				x					
Kiowa County	x		x	x					
City of Greensburg	x			x					
City of Haviland				x					
City of Mullinville				x					
Pawnee County		x		x	x				
City of Burdett				x					
City of Garfield				x					
City of Larned	x		x	x					

Table 5.2: Jurisdictional Planning Capabilities

Jurisdiction	Comprehensive Plan	Critical Facilities Plan	Debris Management Plan	Emergency Operations Plan	Evacuation Plan	Firewise or other Fire Mitigation Plan	Flood Mitigation Assistance Plan	Recovery Plan	Vulnerable Population Plan or Inventory
City of Rozel				x					
Pratt County		x	x	x	x			x	
City of Byers				x	x				
City of Coats				x	x				
City of Cullison				x	x				
City of Iuka				x	x				
City of Pratt				x	x				
City of Preston				x	x				
City of Sawyer				x	x				
Stafford County				x					
City of Hudson				x					
City of Macksville				x					
City of Radium				x					
City of Seward				x					
City of St. John				x					
City of Stafford	x			x			x		

5.4.2 – Jurisdictional Codes and Ordinances

Participating jurisdictions were asked if the following codes and ordinances and plans were established and enforced:

Building Code: Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through the building code.

Floodplain Ordinance: In general, floodplain ordinances are used to:

- Minimize the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage.
- Prevent and minimize loss of life, injuries, and property damage in flood hazard areas.
- Promote the public health, safety and welfare of citizens in flood hazard areas.

Floodplain ordinances may allow jurisdictions to:

- Manage planned growth
- Adopt local ordinances to regulate uses in flood hazard areas
- Enforce those ordinances
- Grant permits for use in flood hazard areas that are consistent with the ordinance

These ordinances can also help ensure meeting the minimum requirements of participation in the NFIP. The incentive for local governments adopting such ordinances is that they will afford their residents the ability to purchase flood insurance through the NFIP.

Stormwater Ordinance: The purpose of a stormwater ordinance is to protect the quality and quantity of local, regional and state waters from the potential harm of unmanaged stormwater. Stormwater ordinances include protection from activities that result in the degradation of properties, water quality, stream channels, and other natural resources.

Nuisance Ordinance: Local governments may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard.

Zoning: Zoning is the traditional and most common tool available to local jurisdictions to control the use of land. Zoning is used to promote health, safety, and the general welfare of the community. Zoning is used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population. Local governments are authorized to divide their jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, special use districts or conditional use districts. Zoning ordinances consist of maps and written text.

The table below summarizes relevant jurisdictional policies and ordinances.

Table 5.3: Jurisdictional Codes and Ordinances

Jurisdiction	Building Code	Floodplain Ordinance	Nuisance Ordinance	Storm Water Ordinance	Zoning Ordinance
Barber County			x		
City of Hardtner			x		
City of Hazelton			x		
City of Isabel			x		
City of Kiowa	x	x	x		x
City of Medicine Lodge	x	x	x		x
City of Sharon		x	x		
City of Sun City			x		

Table 5.3: Jurisdictional Codes and Ordinances

Jurisdiction	Building Code	Floodplain Ordinance	Nuisance Ordinance	Storm Water Ordinance	Zoning Ordinance
Barton County	x	x	x		x
City of Albert	x		x		x
City of Claflin	x	x	x		x
City of Ellinwood	x	x	x		x
City of Galatia			x		
City of Great Bend	x	x	x	x	x
City of Hoisington	x	x	x	x	x
City of Olmitz			x		
City of Pawnee Rock	x	x	x	x	
City of Susank		x	x		
Comanche County			x		x
City of Coldwater	x		x		x
City of Protection		x	x		x
City of Wilmore			x		
Edwards County		x	x		x
City of Belpre			x		
City of Kinsley	x	x	x		x
City of Lewis			x		
City of Offerle			x		
Kiowa County			x		
City of Greensburg	x	x	x	x	x
City of Haviland		x	x		
City of Mullinville		x	x		
Pawnee County		x		x	x
City of Burdett		x	x	x	x
City of Garfield		x	x	x	x
City of Larned	x	x	x	x	x
City of Rozel	x	x	x	x	x
Pratt County		x			
City of Byers			x		
City of Coats			x		
City of Cullison			x		
City of Iuka			x		
City of Pratt	x	x	x	x	x
City of Preston		x	x		

Table 5.3: Jurisdictional Codes and Ordinances

Jurisdiction	Building Code	Floodplain Ordinance	Nuisance Ordinance	Storm Water Ordinance	Zoning Ordinance
City of Sawyer					
Stafford County			x		
City of Hudson			x		
City of Macksville			x		
City of Radium			x		
City of Seward			x		
City of St. John	x		x		x
City of Stafford	x	x	x		

5.4.3 – Jurisdictional Programs

This part of the capability's assessment includes the identification and evaluation of existing programs for each participating jurisdiction:

Community Rating System program under the National Flood Insurance Program: The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Participants are offered flood insurance premium rates at a discount to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS. These goals are the reduction of flood damage to insurable property, the strengthening and support of insurance aspects of the NFIP, and the encouragement of a comprehensive approach to floodplain management.

Firewise Community Certification: The Firewise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. Firewise is a key component of Fire Adapted Communities, a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk. The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

ISO Fire Rating: This assessment also includes the identification and evaluation of existing ISO fire ratings. The Fire Suppression Rating Schedule is a manual containing the criteria ISO uses in reviewing the fire prevention and fire suppression capabilities of individual communities or fire protection areas. The schedule measures the major elements of a community's fire protection system and develops a numerical grading called a Public Protection Classification.

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

***National Weather Service StormReady Program*:** StormReady uses a grassroots approach to help communities develop plans to handle all types of severe weather. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations

The table below summarizes relevant local programs.

Table 5.4: Jurisdictional Programs

Jurisdiction	Community Rating System program	Firewise Community Certification	ISO Fire Rating	National Flood Insurance Program	National Weather Service Storm Ready Certification
Barber County			x		
City of Hardtner					
City of Hazelton					
City of Isabel					
City of Kiowa			x	x	
City of Medicine Lodge			x	x	
City of Sharon				x	
City of Sun City					
Barton County				x	
City of Albert			x		
City of Claflin			x	x	
City of Ellinwood			x	x	
City of Galatia			x		
City of Great Bend			x	x	
City of Hoisington			x	x	
City of Olmitz			x		
City of Pawnee Rock			x	x	
City of Susank				x	
Comanche County			x		x
City of Coldwater			x		
City of Protection				x	
City of Wilmore					

Table 5.4: Jurisdictional Programs

Jurisdiction	Community Rating System program	Firewise Community Certification	ISO Fire Rating	National Flood Insurance Program	National Weather Service Storm Ready Certification
Edwards County				x	
City of Belpre			x		
City of Kinsley			x	x	
City of Lewis			x		
City of Offerle			x		
Kiowa County			x		
City of Greensburg			x	x	
City of Haviland			x	x	
City of Mullinville			x		
Pawnee County				x	
City of Burdett				x	
City of Garfield				x	
City of Larned			x	x	
City of Rozel				x	
Pratt County			x	x	
City of Byers			x		
City of Coats			x		
City of Cullison			x		
City of Iuka			x		
City of Pratt	x		x	x	
City of Preston			x	x	
City of Sawyer			x		
Stafford County					
City of Hudson					
City of Macksville					
City of Radium					
City of Seward					
City of St. John			x		
City of Stafford			x	x	

In addition, participating jurisdictions operate with mutual aid agreements. These are understandings among localities to lend assistance across jurisdictional boundaries. Mutual aid may be requested only when an emergency occurs that exceeds local resources.

5.4.4 – Jurisdictional Staffing and Departmental Capabilities

A comprehensive mitigation program relies on many skilled professionals. These professionals include:

- Planners
- Emergency managers
- Floodplain managers
- GIS personnel

While exact responsibilities differ from jurisdiction to jurisdiction, the general duties of applicable departments are described below:

Building Official: Building officials are generally the jurisdictional administrator of building and construction codes, engineering calculation supervision, permits, facilities management, and accepted construction procedures. They may also inspect structures to ensure compliance with the plans and to check workmanship as well as code compliance.

Emergency Management Coordinator: The Emergency Management office is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events. The formation of an emergency management department in each county is mandated under Kansas General Statutes.

Local Emergency Planning Committee: Local Emergency Planning Committees are generally housed at the county or municipal level. They do not function in actual emergency situations, but attempt to identify and catalogue potential hazards, identify available resources, mitigate hazards when feasible, and write emergency plans. The role of the LEPC is to anticipate and plan the initial response for foreseeable disasters in their jurisdiction.

Mapping Specialist: A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. A GIS mapping specialist uses this data to create county maps, including flood plain, fire hazard, drought and other mitigation maps.

NFIP Floodplain Administrator: The NFIP floodplain administrator ensures a jurisdiction is meeting the minimum requirements of participation in the NFIP, and often is tasked with applying for funding or grants.

Planning Department: A planning department usually provides management and oversight of development through the application of codes, ordinances, building regulations and public input.

Public Works Official: Public works officials usually provide management and oversight of infrastructure projects such as public buildings (municipal buildings, schools, hospitals), transport infrastructure (roads, railroads, bridges, pipelines, airports), public spaces (public squares, parks), public services (water supply, sewage, electrical grid, dams), and other physical assets and facilities.

The table below summarizes relevant local staffing and departmental capabilities.

Table 5.6: Jurisdictional Staffing and Departmental Capabilities

Jurisdiction	Building Code Official or Inspector	Emergency Management Coordinator	Local Emergency Planning Committee	Mapping Specialist	NFIP Floodplain Administrator	Planning Department	Public Works Official
Barber County		x	x	x			x
City of Hardtner			x				x
City of Hazelton			x				x
City of Isabel			x				x
City of Kiowa	x		x		x		x
City of Medicine Lodge	x		x	x	x	x	x
City of Sharon			x		x		x
City of Sun City			x				x
Barton County		x	x	x	x		x
City of Albert			x				x
City of Claflin	x	x	x		x	x	x
City of Ellinwood	x		x		x		x
City of Galatia			x				x
City of Great Bend	x		x	x	x	x	x
City of Hoisington	x		x	x	x	x	x
City of Olmitz			x				x
City of Pawnee Rock	x		x		x		x
City of Susank			x		x		
Comanche County		x	x				x
City of Coldwater			x				x
City of Protection			x		x		x
City of Wilmore			x				x
Edwards County		x	x		x		x
City of Belpre			x				x
City of Kinsley	x		x		x		x
City of Lewis			x				x
City of Offerle			x				x
Kiowa County		x	x	x			x
City of Greensburg	x		x		x		x
City of Haviland			x		x		x
City of Mullinville			x				x
Pawnee County		x	x	x	x	x	x
City of Burdett			x		x		x

Table 5.6: Jurisdictional Staffing and Departmental Capabilities

Jurisdiction	Building Code Official or Inspector	Emergency Management Coordinator	Local Emergency Planning Committee	Mapping Specialist	NFIP Floodplain Administrator	Planning Department	Public Works Official
City of Garfield			x		x		x
City of Larned	x		x	x	x	x	x
City of Rozel			x		x		x
Pratt County		x	x	x	x		x
City of Byers			x				x
City of Coats			x				x
City of Cullison			x				x
City of Iuka			x				x
City of Pratt	x		x		x	x	x
City of Preston	x		x		x		x
City of Sawyer			x				x
Stafford County			x				x
City of Hudson			x				x
City of Macksville			x				x
City of Radium			x				x
City of Seward			x				x
City of St. John			x				x
City of Stafford	x		x		x		x

5.4.5 – Non-Governmental Organizations Capabilities

Non-Governmental Organizations (NGOs) are legally constituted corporations that operate independently from any form of government and are not conventional for-profit businesses. In the cases in which NGOs are funded totally or partially by a government agency, the NGO maintains its non-governmental status by excluding government representatives from membership in the organization. The following is a brief discussion of both the American Red Cross and the Salvation Army, both of which provide regional operations and coverage.

> ***American Red Cross:*** The American Red Cross is a humanitarian organization that provides emergency assistance, disaster relief and education. In addition, they offer services in five other areas: community services that help the needy; communications services and comfort for military members and their family members; the collection, processing and distribution of blood and blood products; educational programs on preparedness, health, and safety; and international relief and development programs.

Salvation Army: The Salvation Army is a Christian denomination and international charitable organization. In addition to being among the first to arrive with help after natural or man-made disasters, the Salvation Army runs charity shops and operates shelters for the homeless.

5.4.6 – Jurisdictional Fiscal Capabilities

In general, the jurisdictions of the Kansas **Region E** receive the majority of their revenue through state and local sales tax and federal and state pass through dollars. Based on available revenue information, and given that both the state and counties are experiencing budget deficits, funding for mitigation programs and disaster response is at a premium. Adding to the budget crunch is the increased reliance on local accountability by the federal government.

The following provide brief definitions of applicable fiscal programs:

Application and Management of Grant Funding: The jurisdiction has the staffing and capabilities to apply for grant funding and oversee all necessary provisions of the funding.

Authority to Levy Taxes: The authority to levy taxes would allow the jurisdiction to tax its population base.

Authority to Withhold Spending in Hazard Prone Areas: The ability of a jurisdiction to not provide funding for activities or actions in an area that is known to be prone to specific hazards.

Incur Debt through General Obligation Bonds: General obligation bonds are issued with the belief that a municipality will be able to repay its debt obligation through taxation or revenue from projects. General obligation bonds can be used to generate funds for mitigation projects.

Usage of Capital Improvement Funding for Mitigation Projects: Capital improvement allows for spending on identified capital projects and for equipment purchases, in this context related to mitigation projects.

The following table highlights each jurisdiction's fiscal capabilities.

Table 5.7: Jurisdictional Financial Capabilities

Jurisdiction	Apply for and Manage Grant Funding	Authority to levy taxes for specific purposes	Authority to Withhold spending in hazard prone areas	Incur Debt through General Obligation Bonds	Usage of Capital Improvement Funding for Mitigation Projects
Barber County	x	x		x	x
City of Hardtner	x	x		x	x
City of Hazelton	x	x		x	x
City of Isabel	x	x		x	x

Table 5.7: Jurisdictional Financial Capabilities

Jurisdiction	Apply for and Manage Grant Funding	Authority to levy taxes for specific purposes	Authority to Withhold spending in hazard prone areas	Incur Debt through General Obligation Bonds	Usage of Capital Improvement Funding for Mitigation Projects
City of Kiowa	x	x		x	x
City of Medicine Lodge	x	x		x	x
City of Sharon	x	x		x	x
City of Sun City	x	x		x	x
Barton County	x	x		x	x
City of Albert	x	x		x	x
City of Claflin	x	x	x	x	x
City of Ellinwood	x	x		x	x
City of Galatia	x	x		x	x
City of Great Bend	x	x		x	x
City of Hoisington	x	x		x	x
City of Olmitz	x	x		x	x
City of Pawnee Rock	x	x			x
City of Susank	x	x		x	x
Comanche County	x	x		x	x
City of Coldwater	x	x		x	x
City of Protection	x	x		x	x
City of Wilmore	x	x		x	x
Edwards County	x	x		x	x
City of Belpre	x	x		x	x
City of Kinsley	x	x		x	x
City of Lewis	x	x		x	x
City of Offerle	x	x		x	x
Kiowa County	x	x		x	x
City of Greensburg	x	x		x	x
City of Haviland	x	x		x	x
City of Mullinville	x	x		x	x
Pawnee County	x	x		x	x
City of Burdett	x	x		x	x
City of Garfield	x	x		x	x
City of Larned	x	x		x	x
City of Rozel	x	x		x	x
Pratt County	x	x	x	x	x
City of Byers	x	x	x	x	x
City of Coats	x	x	x	x	x

Table 5.7: Jurisdictional Financial Capabilities

Jurisdiction	Apply for and Manage Grant Funding	Authority to levy taxes for specific purposes	Authority to Withhold spending in hazard prone areas	Incur Debt through General Obligation Bonds	Usage of Capital Improvement Funding for Mitigation Projects
City of Cullison	x	x	x	x	x
City of Iuka	x	x	x	x	x
City of Pratt	x	x		x	x
City of Preston	x	x	x	x	x
City of Sawyer					
Stafford County	x	x		x	x
City of Hudson	x	x		x	x
City of Macksville	x	x		x	x
City of Radium	x	x		x	x
City of Seward	x	x		x	x
City of St. John	x	x		x	x
City of Stafford	x	x		x	x

5.4.7 – School Capability Assessment

Participating school districts were provided with a different set of questions that participating governmental jurisdictions. These questions were asked to ascertain the level of preparedness of the institution.

The following provides brief definitions of terms used in the capability assessment of schools. Please note that some definitions have been provided in previous sections.

Access to Local, Regional and State Funds: The ability to use local, regional and state funding on school activities and improvements.

Active Shooter Plan: An active shooter plan outlines responsibility, means and methods by which resources are deployed during an active shooter scenario.

Capital Improvement Plan: A capital improvement plan guides scheduling of, and spending on, school improvements. A capital improvement plan can guide future development away from identified hazard areas, an incorporate identified mitigation strategies.

District Master Plan: A master plan establishes the overall vision and serves as a guide to decision making. A master plan generally contains information on demographics, land use, transportation, and facilities. As a master plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.

Emergency Operations Plan/Evacuation Plan: An emergency operations plan outlines responsibility, means and methods by which resources are deployed during and following an emergency or disaster. Often included in these plans are detailed evacuation procedures and policies.

Incur Debt through General Obligation Bonds: General obligation bonds are issued with the belief that an entity will be able to repay its debt obligation through taxation or revenue from projects. General obligation bonds can be used to generate funds for mitigation projects.

School Safety or Resource Officer: A person with overall responsibility for safety of the school, students and staff.

Information as to the current capacity of participating schools, colleges and universities is summarized in the following table.

Table 5.8: College, Unified School District or University Capabilities

Jurisdiction	Access to Local, Regional and State funds	Active Shooter Plan or Policy	Capital Improvement Plan	District Master Plan	School Emergency and Evacuation Plans	School Safety or Resource Officers or Dedicated Law Enforcement
Barber County						
USD #254 - Barber County North	x	x	x	x	x	
USD #255 - South Barber County	x	x	x	x	x	
Barton County						
USD #112 - Claflin	x	x	x	x	x	
USD #355 - Ellinwood	x	x	x	x	x	
USD #428 - Great Bend	x	x	x	x	x	
USD #431 - Hoisington	x	x	x	x	x	
Barton County Community College	x	x	x	x	x	x
Comanche County						
USD #300- Comanche County	x	x	x		x	
Edwards County						
USD #347 - Kinsley / Offerle	x	x	x	x	x	
USD #502 - Lewis	x	x	x	x	x	
Kiowa County						
USD #422 - Kiowa County	x	x	x	x	x	
USD #474 - Haviland	x	x	x	x	x	
Pawnee County						
USD #495 – Fort Larned	x	x	x	x	x	
USD #496 – Pawnee Heights	x	x	x	x	x	

Table 5.8: College, Unified School District or University Capabilities

Jurisdiction	Access to Local, Regional and State funds	Active Shooter Plan or Policy	Capital Improvement Plan	District Master Plan	School Emergency and Evacuation Plans	School Safety or Resource Officers or Dedicated Law Enforcement
Pratt County						
USD #382 - Pratt	x	x	x	x	x	
USD #438 – Skyline Schools	x	x	x		x	
Pratt Community College	x	x	x		x	x
Stafford County						
USD #349 - Stafford	x	x	x		x	
USD #350 – St. John-Hudson	x	x	x		x	
USD #351 - Macksville	x	x	x		x	

Additionally, under K.S.A. 72-5457 (General Provisions for the Issuance of Bonds), all Kansas USDs may issue general obligation bonds to:

- Purchase or improve any site or sites necessary for school district purposes including housing and boarding pupils enrolled in an area vocational school
- Acquire, construct, equip, furnish, repair, remodel or make additions to buildings including housing and boarding pupils enrolled in an area vocational school operated under the board of education of a school district

5.5 – Opportunities for Capability Improvement

As part of this plan update, the MPC identified the following opportunities for improvement across the region concerning current capabilities:

- **Local Funding**
  - Integration of mitigation plans with other local plans and programs, such as capital improvement plans
  - Adoption of cost-effective mitigation measures when developing capital improvement projects

- **Public Education and Outreach**
  - Regular deployment of hazard awareness campaigns to enhance public awareness

- **Land Use Planning and Regulations**
  - Continued encouragement of using land use planning to identify areas at risk to natural hazards

- Stormwater retention/detention projects to reduce flooding
- Locally funded buyouts of hazard prone properties

.

- **Floodplain Management**
  - Encourage and support new participation in the NFIP and in the CRS
  - Continue the promotion and enforcement of NFIP and CRS floodplain management programs

6.0 Mitigation Strategy

6.1 – Introduction

As part of this planning effort, Kansas Region E and its participating jurisdictions worked to minimize the risk of future impacts from identified hazards to all citizens. In an attempt to shape future regulations, ordinances and policy decisions, the MPC reviewed and developed a hazard mitigation strategy. This comprehensive strategy includes:

- The consistent review and revision, as necessary, of obtainable goals and objectives
- The consistent review, revision and development of a comprehensive list of potential hazard mitigation actions

The development of a robust mitigation strategy allows for:

- The ability to effectively direct limited resources for maximum benefit
- The ability to prioritize identified hazard mitigation projects to maximize positive outcomes
- The increase in public and private level participation in hazard mitigation through transparency and awareness
- The potential direction of future policy decisions through awareness and education
- The achievement of the ultimate goal of a safer region for all our citizens

Considering the factors listed above, the MPC continues to implement the following mitigation strategy:

- **Implement** the recommendations of this plan.
- **Utilize** existing regulations, policies, programs, procedures, and plans already in place.
- **Share** information on Funding opportunities.
- **Communicate** the information contained in this plan so all jurisdictions and citizens have a clearer understanding of the hazards facing the region and what can be done to mitigate their impacts.
- **Publicize** the success stories that have been achieved through the region's ongoing mitigation efforts.

6.2 – Emergency Management Accreditation Program Integration

As per requirements, in identifying and reviewing mitigation actions the following activities recommended by the EMAP were considered:

- The use of applicable building construction standards
- Hazard avoidance through appropriate land-use practices
- Relocation, retrofitting, or removal of structures at risk
- Removal or elimination of the hazard
- Reduction or limitation of the amount or size of the hazard
- Segregation of the hazard from that which is to be protected
- Modification of the basic characteristics of the hazard
- Control of the rate of release of the hazard
- Provision of protective systems or equipment for both cyber or physical risks

- Establishment of hazard warning and communication procedures
- Redundancy or duplication of essential personnel, critical systems, equipment, and information materials.

6.3 – Problem Statements

Based on the regionally identified hazards, problem statements have been developed to detail identified major concerns that can potentially be addressed through proposed mitigation actions. Problems statements were developed using the following inputs:

- Identify a key point of concern
- Is the problem getting worse, better, or staying the same?
- What are the identified or potential impacts?

The following table present regional problem statements to be utilized in informing the review, modification and development of hazard mitigation actions.

Table 6.1: Kansas Region E Problem Statements

Identified Hazard	Problem Statement
All Hazards	Current public outreach initiatives need to be expanded
Flood	The number of flood insurance policies have decreased from 2012 to 2018

County specific problem statements were generated through discussions with participating jurisdictions within that county, to be utilized in informing the review, modification and development of hazard mitigation actions. Additionally, problem statements from the public survey are incorporated to provide a community wide view. Problems statements were developed using the following inputs:

- Location
- Identified hazard
- Key point of concern

The following table present problem statements for each county

Table 6.2: Kansas Region E Community Problem Statements

Jurisdiction	Identified Hazard(s)	Problem Statement
Barber County	Tornado	County does not have an adequate number of safe rooms.
Barber County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.
Barton County	Winter Storm	Ice storms may damage utilities causing loss of heat and power.
Barton County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.
Barton County	Utility Failure	Rural water utility wells are located within the flood plain and are subject to flood waters and contamination.

Table 6.2: Kansas Region E Community Problem Statements

Jurisdiction	Identified Hazard(s)	Problem Statement
Barton County	Tornado	County does not have an adequate number of safe rooms and/or shelters to protect citizens.
Barton County	Utility Failure	Water treatment plants are located near or in flood zones and subject to flooding causing water quality issues downstream.
Barton County	Tornado	County does not have an adequate number of safe rooms and/or shelters to protect citizens.
Barton County	Windstorm	Damages to trees in rights-of-way as well as close to roads and right-of-ways causing loss of utilities.
Barton County	Winter Storm	Ice storms may damage utilities causing loss of heat and power.
Barton County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.
Barton County	Utility Failure	Rural water utility wells are located within the flood plain and are subject to flood waters and contamination.
Comanche County	Tornado	County does not have an adequate number of safe rooms and/or shelters to protect citizens.
Comanche County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.
Edwards County	Tornado	County does not have an adequate number of safe rooms and/or shelters to protect citizens.
Edwards County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.
Kiowa County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.
Kiowa County	Windstorm	Damages to trees may close roads and cause a loss of utilities.
Pawnee County	Flood	Remove debris from under Pawnee River bridges.
Pawnee County	Tornado	Need to develop a MOU with USD 495 to allow the public to access storm shelters.
Pratt County	Tornado	County does not have an adequate number of safe rooms and/or shelters to protect citizens.
Pratt County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.
Pratt County	Windstorm	Damages to trees may close roads and cause a loss of utilities.
Stafford County	Tornado	County does not have an adequate number of safe rooms.
Stafford County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards.

6.4 – Identification of Goals

44 CFR 201.6 (c)(3)(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Through thorough discussions at stakeholder meetings, the MPC determined that the four previously identified primary hazard mitigation goals remained relevant and applicable. This was because the

priorities of Kansas Region E in relation to hazard mitigation planning have not changed during the five-year planning cycle. These goals were reviewed through a well-established consideration process, instituted by the MPC during previous plan updates, which consisted of:

- A review of previously identified hazard mitigation goals
- A review of demographic and built environment data
- A review of identified hazards, hazard events, and vulnerabilities
- A review all identified hazard mitigation actions

The following goals represent the Kansas Region E vision for hazard mitigation and disaster resilience.

- **Goal 1:** Reduce or eliminate risk to the people and property of Kansas Region E from the impacts of the identified hazards in this plan.
- **Goal 2:** Strive to protect all vulnerable populations, structures, and critical facilities in Kansas Region E from the impacts of the identified hazards.
- **Goal 3:** Improve public outreach initiatives to include education, awareness and partnerships with all entities in order to enhance understanding of the risk Kansas Region E faces due to the impacts of the identified hazards.
- **Goal 4:** Enhance communication and coordination among all agencies and between agencies and the public.

6.5 – Completed Mitigation Actions

Since the completion of the previous HMP, each jurisdiction has been tracking the completion status of all identified hazard mitigation actions. Each of the following completed actions should be viewed as a testament to the effectiveness of the HMP and a positive step in creating safer and more resilient communities.

Table 6.3: County and Participating Jurisdictions Completed Hazard Mitigation Actions

Jurisdiction	Action Description
Pratt County	Purchase and install a reverse 911and/or emergency notification system in Pawnee County.
Pratt County	Purchase and install a security system for Pratt Regional Medical center and all Annexes.
Pratt County	Construct a Decontamination/ Emergency Bay to decontaminate individuals before they enter the Pratt Regional Medical Center.
Pratt Community College	Research and pursue funding for the implementation of alternative forms of public warning and mass notification systems during inclement weather and/or emergencies.

Kansas Region E is committed to pursuing funding to complete all major hazard mitigation projects.

6.6 – Review and Addition of Mitigation Actions

For this plan update, members of the MPC and participating jurisdictions were asked to complete a thorough review of all not completed mitigation actions. Additionally, MPC members and participating jurisdictions were provided with the opportunity to identify and incorporate newly identified actions based

- Hazard events that have occurred since the last plan revision
- Updated risk assessments
- Identified goals and objectives
- Changing local capabilities
- New vulnerabilities.

In identifying new, or reviewing existing mitigation actions, the following general categories were considered:

Local Plans and Regulations: Actions that influence the way land and buildings are developed or constructed. Actions may include:

- Revision or institution planning and zoning ordinances
- Revision or institution of building codes
- Open space preservation
- Revision or institution Floodplain regulations
- Revision or institution stormwater management regulations
- Drainage system maintenance
- Requirements for riverine setbacks

Structure and Infrastructure Projects: Actions that involve the modification of existing structures to protect, or remove from, a hazard or hazard area. Actions may include:

- Acquisition of hazard prone properties
- Relocation of hazard prone properties
- Revision or institution of building elevation requirements
- Critical facilities protection
- Installation or retrofitting of community safe rooms
- Requiring insurance
- Installation or update of warning systems

Natural Systems Protection: Actions that minimize hazard losses to natural systems. Actions may include:

- Mandatory Floodplain area protection
- Revision or institution of comprehensive watershed management programs
- Requirements for riparian buffers
- Requirements for forest and shrub management
- Revision or institution of erosion and sediment control
- Wetland preservation and restoration
- Slope stabilization programs

Education and Awareness Programs: Actions to inform and educate about potential hazards and actions to mitigate against them. Actions may include:

- Educational outreach programs
- Speaker and/ or demonstration events
- Notifying citizens on where to get information
- School educational and event programs

Each action was reviewed using the following metrics, asking if it was:

- **Specific** – The action addresses a hazard or need
- **Measurable** – Achievement or progress can be measured
- **Attainable** – Accepted by those responsible for achieving it
- **Relevant –** Substantively addresses the problem
- **Time-bound** – Time period for achievement is clearly stated

Additionally, the MPC and each jurisdiction was instructed to provide a brief summary regarding the status of each of these actions using the following:

- **Not Started:** Action will provide reason(s) for lack of progress, which may include lack of Funding, differing priorities, changes in political climate, lack of technical skills, etc.
- **In progress:** Action will provide a summary, and if applicable, a of percentage work completed to date.
- **Deleted:** Actions deemed no longer viable were marked for deletion from the plan. These actions are detailed in the next section.

6.7 – Prioritization of Mitigation Actions

44 CFR 201.6 (c)(3)(iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section 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.

All participating jurisdictions worked together to review and prioritize both previously identified and newly created hazard mitigation actions, with a self-analysis method used for prioritization. This methodology takes all considerations into account to ensure that, based on capabilities, funding, public wishes, political climate, and legal framework and context, reasonable actions are determined. Major determining factors included the potential effects on the overall risk to life and property, ease of implementation, community and agency support, consistency with mitigation goals, and the availability of Funding.

Of major concern was the potential cost of each action. In general, identified actions were proposed to reduce future damages. As such, it is critical that selected and implemented actions provide a greater

saving over the life of the action than the initial cost. For structural and property protection actions cost effectiveness is primarily assessed on:

- Likelihood of damages occurring
- Severity of the damages
- Potential effectiveness

For all other type of actions, including legislative actions, codes and ordinances, maintenance and education, cost effectiveness is primarily assessed on likely future benefits as these actions may not easily result in a quantifiable reduction in damage.

Based on this review, both previously identified and new action items were prioritized as per the following:

High priority:
- Actions that should be implemented as soon as possible
- Actions deemed most critical to achieve the identified mitigation goals

Medium priority:
- Actions that should be implemented in the long-term
- Actions deemed important to meet identified mitigation goals

Low priority
- Actions that should be implemented if Funding becomes available
- Actions that have lowest impact toward achieving mitigation goals

6.8 – Jurisdictional Mitigation Actions

44 CFR 201.6 (c)(3)(ii): 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.

44 CFR 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.

The following tables identify mitigation action items for each participating jurisdiction, along with the following information:

- Hazard addressed
- Responsible party
- Overall priority
- Goal(s) addressed
- Estimated cost
- Potential Funding source

- Proposed completion timeframe
- Current status
- New actions that have been added to this plan update are identified as such.
- Actions that are in support of **NFIP** compliance are identified with a bold type **NFIP**

6.8.1 – Barber County and Participating Jurisdictions Mitigation Actions

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Barber County-1	Conduct Public Education for drought, dam failure, earthquake, extreme heat, pandemic, thunderstorms, tornadoes, wildfires, winter storms.	Dam Failure, Drought, Earthquake, Extreme Heat, Flood (**NFIP**), Pandemic, Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager, Rural Electric Coop Supervisor	High	3	$1,000 annual	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-2	Assist local farmers in building detention ponds to help retain water for times of drought.	Dam Failure, Drought, Extreme Heat, Flood (**NFIP**), Wildfire, Winter Storm	Emergency Manager	High	1	Staff Time	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-3	Purchase a Multi-Purpose Public Address and Warning System.	All Hazards	Emergency Manager	High	1,2,3	$40,000	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-4	Purchase and provide a NOAA Weather Radio to students and residents in the county to warn them of weather events (including lightning and hail events).	All Hazards	Emergency Manager	High	1,2,3	$5,000	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Barber County-5	Build community storm shelters and hazard supply staging areas around the county and school districts to be prepared for all hazard events.	All Hazards	Emergency Manager	High	1,2	$200,000 - $500,000	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-6	Build an Emergency Operations Center/911 Call Center/Community Storm Shelter. Currently, the communities EOC's are not shelters and are vulnerable to hazards.	All Hazards	Emergency Manager	High	1,2,4	$200,000 - $500,000	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-7	Install electronic water level warning devices at key areas upstream and danger levels to notify the emergency management departments of possible impending Flood (**NFIP**) from the watersheds, lakes, and rivers.	Dam and Levee Failure, Drought, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	Emergency Manager	High	1,2	$500 per device	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-8	Have a program to reduce or eliminate the Floodplain from the areas around watersheds, lakes, and rivers that is shown on the FIRM Maps.	Dam and Levee Failure, Drought, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	Emergency Manager	High	1,2	$3,000,000 plus	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-9	Continue participation in the **NFIP.**	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm,	Emergency Manager	High	1,2	Staff Time	Local Budget	Continuous	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
		Lightning, Winter Storm							
Barber County-10	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways.	All Hazards	Emergency Manager	Medium	1,2	Staff Time	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-11	Purchase properties that are located in the 100 and 500 year Floodplain throughout the county.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning	Emergency Manager	Medium	1,2	$60,000 per property	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-12	Dredge the lakes, watersheds and river channels located near communities within the county to allow a larger capacity of water and water flow during heavy snows and thunderstorms.	Dam and Levee Failure, Drought, Extreme Heat, Flood (**NFIP**), Winter Storm	Emergency Manager	Medium	1,2	$1,000,000 plus	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-13	Construct Flood (**NFIP**) walls/levies in communities where Flood is prevalent to reduce the Flood within the communities.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	Emergency Manager	High	1,2	$1,000,000 plus	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-14	Upgrade and Enhance Power lines.	All Hazards	Rural Electric Coop Director	Medium	1,2	$1,160,000	HMGP Grant, PDM Grant, Local Budget,	Four years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							Grants, Heartland REC		
Barber County-15	Have a communitywide tree-trimming program to cut down branches and trees away from power lines and drainage areas.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager, Roads and Bridges Director	Medium	1,2	Staff Time	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-16	Purchase backup generators for City Halls, Emergency Operations Centers, Police Departments, Fire Departments, Community Centers, and school districts as well as two portable units for locations as needed throughout the county.	All Hazards	Emergency Manager	Medium	1,2	$10,000 to $15,000 per unit	HMGP Grant, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-17	Provide a reimbursement program for local residents to purchase generators needed at their homes or businesses.	All Hazards	Emergency Manager	Low	1,2	NA	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-18	Purchase County, City, School, and Business Computer Systems Backup	All Hazards	Emergency Manager	Medium	1,2,4	$5,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-19	Determine setup, or build animal keep zones for displaced animals after a disaster.	Dam and Levee Failure, Flood (**NFIP**), Hail,	Emergency Manager	Medium	1,2	$50,000	HMGP, PDM Grant, Local	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
		Windstorm, Lightning, Tornado, Wildfire, Winter Storm					Budget, Grants		
Barber County-20	Purchase an EM Mobile Unit to serve as a command post during a hazard event	All Hazards	Emergency Manager	Medium	4	$50,000 per unit	HMGP Grant, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-21	Develop a residential assessment team to evaluate residential homes for disaster prevention.	All Hazards	Emergency Manager	Low	1,2,3,4	Staff Time	Local Budget	Five years	Not started, lack of funding
Barber County-22	Run a water line to a secondary water source for each of the water districts for times of drought to provide water to the public and for fire protection in the communities.	All Hazards	Emergency Manager	Low	1,2	$500,000 per line	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-23	. Purchase remote weather cameras to view incoming weather events around the county.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	low	1,2	$15,000 per system	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-24	Amend county and city building codes to strengthen structures on new and existing buildings to reduce the effects of earthquake, high wind, and tornados.	Earthquake, Hail, Windstorm, Lightning, Tornado	Emergency Manager, Zoning Director	low	1,2	Staff Time	Local Budget	Five years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Barber County-25	Purchase above Ground Gas Pumps With Backup Generators for County and City Vehicles.	Dam and Levee Failure, Earthquake, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	low	1,2	$15,000 per setup	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-26	Set up cool/heat zones at the county, cities, and school districts where children and families can remove themselves from the cold or heat.	Extreme Heat, Winter Storm	Emergency Manager	Medium	1,2	$2,000 per setup	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-27	Set up outdoor drinking sources at the parks, schools and in the communities where children and adults can re-hydrate themselves.	Extreme Heat	Emergency Manager	Medium	1,2	$500 per fountain	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-28	Provide Fans and Air Conditioners for the poor and the elderly throughout the community.	Extreme Heat	Emergency Manager	Medium	1,2	Staff Time	Donations	Five years	Not started, lack of funding
Barber County-29	Conduct a Hazardous Material Waste Removal Day Program	Dam and Levee Failure, Earthquake, Flood (**NFIP**), Tornado, Wildfire	Emergency Manager	Medium	1,2	$20,000	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Barber County-30	Purchase protective window film for all county, city and school building windows to reduce the risk of airborne debris injuries during extreme hazard events.	Earthquake, Hail, Windstorm, Lightning, Tornado	Emergency Manager	Low	1,2	$5,000	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-31	Purchase lightning detection systems to provide warnings at city parks, campgrounds, and school recreation areas.	Hail, Windstorm, Lightning	Emergency Manager	Low	1,2	$5,000 per unit	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-32	Purchase Pumper Trucks and Fire Equipment.	Wildfire	Emergency Manager	Low	1,2	$40,000 per unit	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-33	Seek funding for the construction of the Individual Safe Room Program.	Hail, Windstorm, Lightning, Tornado	Emergency Manager	Medium	1,2	Staff Time	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-34	Promote Hurricane Straps to Contractors and Homeowners.	Earthquake, Hail, Windstorm, Lightning, Tornado	Emergency Manager	Low	1,2,3	Staff Time	Local Budget	Five years	Not started, lack of funding
Barber County-35	Develop a countywide storm shelter and safe room database with latitude and longitude of each individual safe room in the communities.	All Hazards	Emergency Manager	Low	1,2	$5,000	HMGP, PDM Grant, Local	Five years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							Budget, Grants		
Barber County-36	Bury Electrical Lines Program. Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	Emergency Manager, RECs	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Barber County-37	Become a Firewise Community.	Drought, Wildfire	Emergency Manager	High	1,2	$10,000 plus	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-38	Initiate a Waterline Insulation Program.	Winter Storm	Emergency Manager	Low	2	Volunteer Labor	Staff Time and Volunteer Labor	Five years	Not started, lack of funding
Barber County-39	Develop a Storm Spotter Programs.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado	Emergency Manager	Medium	3,4	Staff Time	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-40	Construct snow fences along the highways to reduce the risk of blowing snow build up on the roads.	Winter Storm	Emergency Manager	Low	1,2	$500,000 Countywide	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Barber County-41	Volunteer Irrigation Program. Create a list of farmers willing to assist other farmers in developing irrigation lanes in their crop fields.	Drought, Wildfire	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	Local Budget	Five years	Not started, lack of funding
Barber County-42	Evergreen Removal Program. Have the rural and city fire departments work with	Wildfire	Emergency Managers	Low	1,2	$20,000 a year	HMGP, PDM Grant,	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	local farmers and landowners to remove wild evergreen trees from their fields.						Local Budget, Grants		
Barber County-43	Develop and implement a Perimeter Wildfire Zone Ordinance.	Wildfire	Emergency Managers	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Barber County-44	Have the rural and local fire departments, State Forestry Service, and area farmers conduct controlled burns on highly vegetative fields to reduce the threat of wildfires.	Drought, Wildfire	Emergency Manager	High	1,2	$20,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-45	Construct a hazardous materials dump depot for area residents to rid their households of hazardous waste.	Dam and Levee Failure, Earthquake, Flood (**NFIP**), Tornado	Emergency Managers	Medium	1,2	$20,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-46	Purchase a reverse 911 system for the community.	All Hazards	Emergency Manager	High	1,2,3,4	$50,000 per system	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-47	Enter CRS Program.	Flood (**NFIP**)	Emergency Manager	High	1,2	NA	NA	Three years	Not started, lack of funding
Barber County-48	Upgrade and Revise Subdivision Ordinance to prevent Flood damages	Flood (**NFIP**)	Emergency Manager	low	1,2	NA	NA	Three years	Not started, lack of funding
Barber County-49	Aerial Photography and Mapping. Update existing photos to help with emergency response and rescue missions in the event of a disaster.	Flood (**NFIP**), Tornado	Emergency Manager	Medium	1,2	$175,000	HMGP, PDM Grant, Local	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							Budget, Grants		
Barber County-50	Establish two additional weather stations in the Barber County area.	Drought, Extreme Heat, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	Low	1,2	$70,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-51	Elevation Survey of Critical Facilities. Determine the suitability for occupancy of critical facilities during Flood (**NFIP**) events by way of building surveys.	Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	Emergency Manager	low	2	$600 per survey	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-52	Purchase and install battery Backup for Traffic Signals on Arterial Streets.	Earthquake, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	low	1,2	$190,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-53	Purchase a tub grinder for the Solid Waste Division to expedite disposal of debris generated by disasters.	Flood (**NFIP**), Windstorm, Hail, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	Low	1,2	$300,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-54	Roll-off Trash Container with Crane Attachment for Solid Waste Division.	Flood (**NFIP**), Hail, Windstorm, Lightning,	Emergency Manager	Low	1,2	$300,000	HMGP, PDM Grant, Local	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
		Winter Storm, Wildfire					Budget, Grants		
Barber County-55	Skid-Steer Loader with Loading Claw Attachment. ..	Flood (**NFIP**), Windstorm, Hail, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	Low	1,2	$100,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-56	Combine the 911 system with any GIS data gathered to help emergency responders reduce response time.	Drought, Earthquake, Extreme Heat, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	Medium	4	$250,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-57	Outage Reporting System. Combine the Electric SCADA with GIS data which would help reduce response time during outages.	Earthquake, Flood (**NFIP**), Hail, Windstorm, Lightning, Tornado, Wildfire, Winter Storm	Emergency Manager	Medium	4	$150,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-58	Engineering inspection and testing of grounding system, and lightning protection of public owned communication and water towers to improve lightning	Lightning	Emergency Manager	Low	1,2	$50,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-59	Construction to correct defects in communication and water tower grounding systems and installation of	Lightning	Emergency Manager	Low	1,2	$75,000	HMGP, PDM Grant,	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	lightning arrestors and electrical surge protection for lightning induced electrical surges .						Local Budget, Grants		
Barber County-60	Sun shading panels to protect equipment sensitive to extreme heat.	Extreme Heat	Emergency Manager	Medium	1,2	$125,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-61	Upgrade Fire Department radio system to become Project 25 compliant.	Multi-Hazard	Emergency Manager	Medium	3,4	$500,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-62	E-911 Consoles. Update E-911 Center work consoles to provide enhanced response environment.	All Hazards	Emergency Manager	Medium	4	$105,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Barber County-63	E-911 Radios. Update obsolete radios in E-911 Center to enhance emergency communication capabilities.	All Hazards	Emergency Manager	Medium	4	$40,000	HMGP, PDM Grant, Local Budget, Grants	Three years	Not started, lack of funding
Hardtner-1	Purchase and install a Multi-Purpose Public Address and Warning System.	All Hazards	City Clerk	High	1,2,3	$40,000	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-2	Build community safe rooms and hazard supply staging areas.	All Hazards	City Clerk	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-3	Continue participation in the **NFIP** and encourage participation in the	Dam and Levee Failure,	City Clerk	High	1,2	Staff Time	Local Budget	Continuous	In progress

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	NFIP for the communities that are not already participants.	Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm							
Hardtner-4	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways. **(NFIP)**	Flood (**NFIP**)	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-5	Purchase properties that are located in the Floodplain. (**NFIP**)	Dam and Levee Failure, Flood (**NFIP**)	City Clerk	Medium	1,2	$60,000 per property	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-6	Institute a tree trimming and branch removal program.	Windstorm, Lightning, Tornado, Wildfire, Winter Storm	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-7	Purchase and install backup generators for critical facilities.	All Hazards	City Clerk	Medium	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-8	Set up outdoor drinking sources at the parks, schools and in the communities	Extreme Heat	City Clerk	Medium	1,2	$500 per fountain	Local, State, Federal	Five years	Not started, lack of funding
Hardtner-9	Purchase protective window film for all county, city and school building windows	Earthquake, Hail, Windstorm, Lightning, Tornado	City Clerk	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
Hardtner-10	Purchase pumper trucks and fire equipment.	Wildfire	City Clerk	Low	1,2	$40,000 per unit	Local, State, Federal	Five years	Not started, lack of funding
Hardtner-11	Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use.	Major Disease Outbreak	City Clerk	Low	1,2	$50 per dispenser	Local, State, Federal	Five years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hardtner-12	Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Hardtner-13	Become a Firewise Community.	Drought, Wildfire	City Clerk	High	1,2	$10,000 plus	Local, State, Federal	Five years	Not started, lack of funding
Hardtner-14	Enter CRS Program. **(NFIP)**	Flood (**NFIP**)	City Clerk	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Hardtner-15	Upgrade and Revise Subdivision Ordinance to prevent Flood damages. **(NFIP)**	Flood (**NFIP**)	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Hardtner-16	Upgrade Fire Department radio systems.	Multi-Hazard	City Clerk	Medium	3,4	$500,000	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-17	Purchase and install additional storm sirens and update control equipment.	Multi-Hazard	City Clerk	Medium	1,2	$84,813	Local, State, Federal	Three years	Not started, lack of funding
Hardtner-18	Upgrade/repair existing water supply infrastructure.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$250,000	Local, State, Federal,	Five years	Not started, lack of funding
Hazelton-1	Purchase and install a Multi-Purpose Public Address and Warning System.	All Hazards	City Clerk	High	1,2,3	$40,000	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-2	Build community safe rooms and hazard supply staging areas.	All Hazards	City Clerk	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-3	Continue participation in the **NFIP** and encourage participation in the **NFIP** for the communities that are not already participants.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	City Clerk	High	1,2	Staff Time	Local Budget	Continuous	In progress

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hazelton-4	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways. **(NFIP)**	Flood (**NFIP**)	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-5	Purchase properties that are located in the Floodplain. (**NFIP**)	Dam and Levee Failure, Flood (**NFIP**)	City Clerk	Medium	1,2	$60,000 per property	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-6	Institute a tree trimming and branch removal program.	Windstorm, Lightning, Tornado, Wildfire, Winter Storm	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-7	Purchase and install backup generators for critical facilities.	All Hazards	City Clerk	Medium	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-8	Set up outdoor drinking sources at the parks, schools and in the communities	Extreme Heat	City Clerk	Medium	1,2	$500 per fountain	Local, State, Federal	Five years	Not started, lack of funding
Hazelton-9	Purchase protective window film for all county, city and school building windows	Earthquake, Hail, Windstorm, Lightning, Tornado	City Clerk	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
Hazelton-10	Purchase pumper trucks and fire equipment.	Wildfire	City Clerk	Low	1,2	$40,000 per unit	Local, State, Federal	Five years	Not started, lack of funding
Hazelton-11	Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use.	Major Disease Outbreak	City Clerk	Low	1,2	$50 per dispenser	Local, State, Federal	Five years	Not started, lack of funding
Hazelton-12	Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Hazelton-13	Become a Firewise Community.	Drought, Wildfire	City Clerk	High	1,2	$10,000 plus	Local, State, Federal	Five years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hazelton-14	Enter CRS Program. **(NFIP)**	Flood (**NFIP**)	City Clerk	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Hazelton-15	Upgrade and Revise Subdivision Ordinance to prevent Flood damages. **(NFIP)**	Flood (**NFIP**)	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Hazelton-16	Upgrade Fire Department radio systems.	Multi-Hazard	City Clerk	Medium	3,4	$500,000	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-17	Purchase and install additional storm sirens and update control equipment.	Multi-Hazard	City Clerk	Medium	1,2	$84,813	Local, State, Federal	Three years	Not started, lack of funding
Hazelton-18	Upgrade/repair existing water supply infrastructure.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$250,000	Local, State, Federal,	Five years	Not started, lack of funding
Isabel-1	Purchase and install a Multi-Purpose Public Address and Warning System.	All Hazards	City Clerk	High	1,2,3	$40,000	Local, State, Federal	Three years	Not started, lack of funding
Isabel-2	Build community safe rooms and hazard supply staging areas.	All Hazards	City Clerk	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
Isabel-3	Continue participation in the **NFIP** and encourage participation in the **NFIP** for the communities that are not already participants.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	City Clerk	High	1,2	Staff Time	Local Budget	Continuous	In progress
Isabel-4	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways. **(NFIP)**	Flood (**NFIP**)	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Isabel-5	Purchase properties that are located in the Floodplain. (**NFIP**)	Dam and Levee Failure, Flood (**NFIP**)	City Clerk	Medium	1,2	$60,000 per property	Local, State, Federal	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Isabel-6	Institute a tree trimming and branch removal program.	Windstorm, Lightning, Tornado, Wildfire, Winter Storm	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Isabel-7	Purchase and install backup generators for critical facilities.	All Hazards	City Clerk	Medium	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Isabel-8	Set up outdoor drinking sources at the parks, schools and in the communities	Extreme Heat	City Clerk	Medium	1,2	$500 per fountain	Local, State, Federal	Five years	Not started, lack of funding
Isabel-9	Purchase protective window film for all county, city and school building windows	Earthquake, Hail, Windstorm, Lightning, Tornado	City Clerk	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
Isabel-10	Purchase pumper trucks and fire equipment.	Wildfire	City Clerk	Low	1,2	$40,000 per unit	Local, State, Federal	Five years	Not started, lack of funding
Isabel-11	Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use.	Major Disease Outbreak	City Clerk	Low	1,2	$50 per dispenser	Local, State, Federal	Five years	Not started, lack of funding
Isabel-12	Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Isabel-13	Become a Firewise Community.	Drought, Wildfire	City Clerk	High	1,2	$10,000 plus	Local, State, Federal	Five years	Not started, lack of funding
Isabel-14	Enter CRS Program. **(NFIP)**	Flood (**NFIP**)	City Clerk	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Isabel-15	Upgrade and Revise Subdivision Ordinance to prevent Flood damages. **(NFIP)**	Flood (**NFIP**)	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Isabel-16	Upgrade Fire Department radio systems.	Multi-Hazard	City Clerk	Medium	3,4	$500,000	Local, State, Federal	Three years	Not started, lack of funding
Isabel-17	Purchase and install additional storm sirens and update control equipment.	Multi-Hazard	City Clerk	Medium	1,2	$84,813	Local, State, Federal	Three years	Not started, lack of funding
Isabel-19	Upgrade/repair existing water supply infrastructure.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$250,000	Local, State, Federal,	Five years	Not started, lack of funding
Kiowa-1	Purchase and install a Multi-Purpose Public Address and Warning System.	All Hazards	City Clerk	High	1,2,3	$40,000	Local, State, Federal	Three years	Not started, lack of funding
Kiowa-2	Build community safe rooms and hazard supply staging areas.	All Hazards	City Clerk	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
Kiowa-3	Continue participation in the **NFIP** and encourage participation in the **NFIP** for the communities that are not already participants.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	City Clerk	High	1,2	Staff Time	Local Budget	Continuous	In progress
Kiowa-4	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways. **(NFIP)**	Flood (**NFIP**)	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Kiowa-5	Purchase properties that are located in the Floodplain. (**NFIP**)	Dam and Levee Failure, Flood (**NFIP**)	City Clerk	Medium	1,2	$60,000 per property	Local, State, Federal	Three years	Not started, lack of funding
Kiowa-6	Institute a tree trimming and branch removal program.	Windstorm, Lightning, Tornado, Wildfire, Winter Storm	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kiowa-7	Purchase and install backup generators for critical facilities.	All Hazards	City Clerk	Medium	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Kiowa-8	Set up outdoor drinking sources at the parks, schools and in the communities	Extreme Heat	City Clerk	Medium	1,2	$500 per fountain	Local, State, Federal	Five years	Not started, lack of funding
Kiowa-9	Purchase protective window film for all county, city and school building windows	Earthquake, Hail, Windstorm, Lightning, Tornado	City Clerk	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
Kiowa-10	Purchase pumper trucks and fire equipment.	Wildfire	City Clerk	Low	1,2	$40,000 per unit	Local, State, Federal	Five years	Not started, lack of funding
Kiowa-11	Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use.	Major Disease Outbreak	City Clerk	Low	1,2	$50 per dispenser	Local, State, Federal	Five years	Not started, lack of funding
Kiowa-12	Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Kiowa-13	Become a Firewise Community.	Drought, Wildfire	City Clerk	High	1,2	$10,000 plus	Local, State, Federal	Five years	Not started, lack of funding
Kiowa-14	Enter CRS Program. **(NFIP)**	Flood (**NFIP**)	City Clerk	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Kiowa-15	Upgrade and Revise Subdivision Ordinance to prevent Flood damages. **(NFIP)**	Flood (**NFIP**)	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Kiowa-16	Upgrade Fire Department radio systems.	Multi-Hazard	City Clerk	Medium	3,4	$500,000	Local, State, Federal	Three years	Not started, lack of funding
Kiowa-17	Purchase and install additional storm sirens and update control equipment.	Multi-Hazard	City Clerk	Medium	1,2	$84,813	Local, State, Federal	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kiowa-18	Upgrade/repair existing water supply infrastructure.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$250,000	Local, State, Federal,	Five years	Not started, lack of funding
Medicine Lodge-1	Purchase and install a Multi-Purpose Public Address and Warning System.	All Hazards	City Clerk	High	1,2,3	$40,000	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-2	Build community safe rooms and hazard supply staging areas.	All Hazards	City Clerk	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-3	Continue participation in the **NFIP** and encourage participation in the **NFIP** for the communities that are not already participants.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	City Clerk	High	1,2	Staff Time	Local Budget	Continuous	In progress
Medicine Lodge-4	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways. **(NFIP)**	Flood (**NFIP**)	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-5	Purchase properties that are located in the Floodplain. (**NFIP**)	Dam and Levee Failure, Flood (**NFIP**)	City Clerk	Medium	1,2	$60,000 per property	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-6	Institute a tree trimming and branch removal program.	Windstorm, Lightning, Tornado, Wildfire, Winter Storm	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-7	Purchase and install backup generators for critical facilities.	All Hazards	City Clerk	Medium	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-8	Set up outdoor drinking sources at the parks, schools and in the communities	Extreme Heat	City Clerk	Medium	1,2	$500 per fountain	Local, State, Federal	Five years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Medicine Lodge-9	Purchase protective window film for all county, city and school building windows	Earthquake, Hail, Windstorm, Lightning, Tornado	City Clerk	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
Medicine Lodge-10	Purchase pumper trucks and fire equipment.	Wildfire	City Clerk	Low	1,2	$40,000 per unit	Local, State, Federal	Five years	Not started, lack of funding
Medicine Lodge-11	Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use.	Major Disease Outbreak	City Clerk	Low	1,2	$50 per dispenser	Local, State, Federal	Five years	Not started, lack of funding
Medicine Lodge-12	Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Medicine Lodge-13	Become a Firewise Community.	Drought, Wildfire	City Clerk	High	1,2	$10,000 plus	Local, State, Federal	Five years	Not started, lack of funding
Medicine Lodge-14	Enter CRS Program. **(NFIP)**	Flood (**NFIP**)	City Clerk	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Medicine Lodge-15	Upgrade and Revise Subdivision Ordinance to prevent Flood damages. **(NFIP)**	Flood (**NFIP**)	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Medicine Lodge-16	Upgrade Fire Department radio systems.	Multi-Hazard	City Clerk	Medium	3,4	$500,000	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-17	Purchase and install additional storm sirens and update control equipment.	Multi-Hazard	City Clerk	Medium	1,2	$84,813	Local, State, Federal	Three years	Not started, lack of funding
Medicine Lodge-18	Upgrade/repair existing water supply infrastructure.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$250,000	Local, State, Federal,	Five years	Not started, lack of funding
Sharon-1	Purchase and install a Multi-Purpose Public Address and Warning System.	All Hazards	City Clerk	High	1,2,3	$40,000	Local, State, Federal	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Sharon-2	Build community safe rooms and hazard supply staging areas.	All Hazards	City Clerk	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
Sharon-3	Continue participation in the **NFIP** and encourage participation in the **NFIP** for the communities that are not already participants.	Dam and Levee Failure, Flood (**NFIP**), Hail, Windstorm, Lightning, Winter Storm	City Clerk	High	1,2	Staff Time	Local Budget	Continuous	In progress
Sharon-4	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways. **(NFIP)**	Flood (**NFIP**)	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Sharon-5	Purchase properties that are located in the Floodplain. (**NFIP**)	Dam and Levee Failure, Flood (**NFIP**)	City Clerk	Medium	1,2	$60,000 per property	Local, State, Federal	Three years	Not started, lack of funding
Sharon-6	Institute a tree trimming and branch removal program.	Windstorm, Lightning, Tornado, Wildfire, Winter Storm	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Sharon-7	Purchase and install backup generators for critical facilities.	All Hazards	City Clerk	Medium	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Sharon-8	Set up outdoor drinking sources at the parks, schools and in the communities	Extreme Heat	City Clerk	Medium	1,2	$500 per fountain	Local, State, Federal	Five years	Not started, lack of funding
Sharon-9	Purchase protective window film for all county, city and school building windows	Earthquake, Hail, Windstorm, Lightning, Tornado	City Clerk	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
Sharon-10	Purchase pumper trucks and fire equipment.	Wildfire	City Clerk	Low	1,2	$40,000 per unit	Local, State, Federal	Five years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Sharon-11	Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use.	Major Disease Outbreak	City Clerk	Low	1,2	$50 per dispenser	Local, State, Federal	Five years	Not started, lack of funding
Sharon-12	Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Sharon-13	Become a Firewise Community.	Drought, Wildfire	City Clerk	High	1,2	$10,000 plus	Local, State, Federal	Five years	Not started, lack of funding
Sharon-14	Enter CRS Program. **(NFIP)**	Flood (**NFIP**)	City Clerk	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Sharon-15	Upgrade and Revise Subdivision Ordinance to prevent Flood damages. **(NFIP)**	Flood (**NFIP**)	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Sharon-16	Upgrade Fire Department radio systems.	Multi-Hazard	City Clerk	Medium	3,4	$500,000	Local, State, Federal	Three years	Not started, lack of funding
Sharon-17	Purchase and install additional storm sirens and update control equipment.	Multi-Hazard	City Clerk	Medium	1,2	$84,813	Local, State, Federal	Three years	Not started, lack of funding
Sharon-18	Upgrade/repair existing water supply infrastructure.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$250,000	Local, State, Federal,	Five years	Not started, lack of funding
Sun City-1	Purchase and install a Multi-Purpose Public Address and Warning System.	All Hazards	City Clerk	High	1,2,3	$40,000	Local, State, Federal	Three years	Not started, lack of funding
Sun City-2	Build community safe rooms and hazard supply staging areas.	All Hazards	City Clerk	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
Sun City-3	Continue participation in the **NFIP** and encourage participation in the **NFIP** for the communities that are not already participants.	Dam and Levee Failure, Flood (**NFIP**), Hail,	City Clerk	High	1,2	Staff Time	Local Budget	Continuous	In progress

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
		Windstorm, Lightning, Winter Storm							
Sun City-4	Have a community wide drainage and stormwater cleanup days to remove all trash and debris from local drainage ways. **(NFIP)**	Flood (**NFIP**)	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Sun City-5	Purchase properties that are located in the Floodplain. (**NFIP**)	Dam and Levee Failure, Flood (**NFIP**)	City Clerk	Medium	1,2	$60,000 per property	Local, State, Federal	Three years	Not started, lack of funding
Sun City-6	Institute a tree trimming and branch removal program.	Windstorm, Lightning, Tornado, Wildfire, Winter Storm	City Clerk	Medium	1,2	Staff Time	Local, State, Federal	Three years	Not started, lack of funding
Sun City-7	Purchase and install backup generators for critical facilities.	All Hazards	City Clerk	Medium	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Sun City-8	Set up outdoor drinking sources at the parks, schools and in the communities	Extreme Heat	City Clerk	Medium	1,2	$500 per fountain	Local, State, Federal	Five years	Not started, lack of funding
Sun City-9	Purchase protective window film for all county, city and school building windows	Earthquake, Hail, Windstorm, Lightning, Tornado	City Clerk	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
Sun City-10	Purchase pumper trucks and fire equipment.	Wildfire	City Clerk	Low	1,2	$40,000 per unit	Local, State, Federal	Five years	Not started, lack of funding
Sun City-11	Purchase equipment and place at locations around the cities and the schools to have hand sanitizer available for use.	Major Disease Outbreak	City Clerk	Low	1,2	$50 per dispenser	Local, State, Federal	Five years	Not started, lack of funding
Sun City-12	Change ordinances to bury electrical lines from the transformer to the house on any new construction.	All Hazards	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Sun City-13	Become a Firewise Community.	Drought, Wildfire	City Clerk	High	1,2	$10,000 plus	Local, State, Federal	Five years	Not started, lack of funding
Sun City-14	Enter CRS Program. **(NFIP)**	Flood (**NFIP**)	City Clerk	High	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Sun City-15	Upgrade and Revise Subdivision Ordinance to prevent Flood damages. **(NFIP)**	Flood (**NFIP**)	City Clerk	Low	1,2	Staff Time	Local Budget	Three years	Not started, lack of funding
Sun City-16	Upgrade Fire Department radio systems.	Multi-Hazard	City Clerk	Medium	3,4	$500,000	Local, State, Federal	Three years	Not started, lack of funding
Sun City-17	Purchase and install additional storm sirens and update control equipment.	Multi-Hazard	City Clerk	Medium	1,2	$84,813	Local, State, Federal	Three years	Not started, lack of funding
Sun City-18	Upgrade/repair existing water supply infrastructure.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$250,000	Local, State, Federal,	Five years	Not started, lack of funding
USD#254-1	Construct safe rooms for all school district buildings.	Tornados	Superintendent	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
USD#254-2	Purchase backup generators for school district buildings	All Hazards	Superintendent	High	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
USD#254-3	Purchase a district-wide computer systems backup.	All Hazards	Superintendent	Medium	1,2,3,4	$5,000	Local, State, Federal	Three years	Not started, lack of funding
USD#254-4	Purchase protective window film for all school facilities.	Earthquake, Hail, Windstorm, Lightning, Tornado	Superintendent	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
USD#254-5	Improve stormwater management systems at Medicine Lodge- Lodge Grade School.	Flood (**NFIP**)	Superintendent	High	1,2	$25,000	Local, State, Federal	Two years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
USD#255-1	Construct safe rooms for all school district buildings.	Tornados	Superintendent	High	1,2	$200,000 - $500,000	Local, State, Federal	Three years	Not started, lack of funding
USD#255-2	Purchase backup generators for school district buildings	All Hazards	Superintendent	High	1,2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
USD#255-3	Purchase a district-wide computer systems backup.	All Hazards	Superintendent	Medium	1,2,3,4	$5,000	Local, State, Federal	Three years	Not started, lack of funding
USD#255-4	Purchase protective window film for all school facilities.	Earthquake, Hail, Windstorm, Lightning, Tornado	Superintendent	Low	1,2	$5,000	Local, State, Federal	Five years	Not started, lack of funding
USD#255-5	Purchase and install multi-purpose public address and warning system for all schools.	Flood (**NFIP**)	Superintendent	High	1,2	$25,000	Local, State, Federal	Two years	Not started, lack of funding
Water Districts-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$10,000 t $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Water Districts-2	Run a water line to a secondary water source for each of the water districts for times of drought	All Hazards	Director	Low	1,2	$500,000 per line	Local, State, Federal	Five years	Not started, lack of funding
Water Districts-3	Sun shading panels to protect equipment sensitive to extreme heat.	Extreme Heat	Director	Low	1,2	$125,000	Local, State, Federal	Three years	Not started, lack of funding
Ninnescah REC-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Ninnescah REC-	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding
South Pioneer REC-1	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,160,000	Local, State, Federal	Four years	Not started, lack of funding

Table 6.4: Barber County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
South Pioneer REC-2	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$10,000 t $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding

6.8.2 – Barton County and Participating Jurisdictions Mitigation Actions

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Barton County-1	The County is committed to continued participation and compliance with the **NFIP**	Flood (**NFIP**)	Floodplain Manager	High	1,2	None	Local, State, Federal	Continuous	In progress
Barton County-2	Conduct an all hazards public education campaign with a goal of reaching 1,000 citizens per year.	All Hazards	Barton County Emergency Management Director	High	3	$75 per event	Local	Five years	In progress
Barton County-3	Continue storm identification training and consider Community Emergency Response Team Training	Tornado, Windstorm	Barton County Emergency Management	Medium	1,2,3,4	$500 per event	Local	Continuous	In progress
Barton County-4	Increase public and fire department awareness and training on wildland urban interface fires and safety.	Wildfire	Barton County Emergency Management	Medium	1,2	$1,000 per workshop	Kansas Forest Service, State and Federal	Four years	Not started, lack of funding
Barton County-5	Trim or remove trees in areas that may block or occlude roadways.	Windstorm, Tornado, Winter Storms, Utility/ Infrastructure Failure	Emergency Manager	Medium	1,2	$10,000 - $50,000	Local, State, Federal	Continuous	Not started, lack of funding
Barton County-6	Clear and keep ditches and waterways clean and clear of debris. Keep drainage and ditches at proper depths and widths. Maintain culverts and bridges at proper sizes and keep them clear of sediment and debris. Increase culvert as necessary	Flood (**NFIP**)	Barton County Road & Bridge, County Engineer, Township trustees	Medium	1,2	$50,000 - $500,000	Local, State	Four years	Not started, lack of funding
Barton County-7	Purchase and implement an alternative form of public warning and mass notification system, such as reverse 911or a system similar to an audible or phone warning alert	All Hazards	911 Director	High	1,2,3	$50,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	system and/or a mass text messaging system that provides a viable option to increase the safety of Barton County residents.								
Barton County-8	Identify, inspect, and replace damaged culverts as needed (NFIP)	Flood, Soil Erosion	Township Trustees	High	1,2	$3,000	HMGP, PDM, Local	One Year	Not started, lack of funding
Barton County-9	Obtain 100 additional NOAA Weather Radios to distribute to county residents	All Hazards	Barton County EM Director	Medium	1,2	$1,000 - $3,000,000 per Site	HMGP, PDM, Local	Two days to 2 years, depending on Site	In progress
Barton County-10	Identify, inspect, and repair, upgrade, or replaced damaged County roadways and related infrastructure as needed	Flood, Windstorm, Winter Storm, Drought, Utility/ Infrastructure Failure, Tornado	Barton County Road & Bridge Director	High	1,2	$500 to $10,000 per site	HMGP, State, Local	10-30 days per site	In Progress
Barton County-11	Identify and mitigate overgrown trees and vegetation along road rights-of-way	Windstorm, Winter Storm, Infrastructure Failure	Barton County Road & Bridge, Township Trustees	Medium	1,2	$50,000 to $100,000	HMGP, State, Local	5 years	Not started, lack of funding
Barton County-12	Purchase / install backup generators in critical facilities	Utility/ Infrastructure Failure	Facilities	Medium	1,2	$3,000	HMGP, PDM, Local	One Year	Not started, lack of funding
Barton County-13	Purchase / install backup generators in critical facilities	Utility/ Infrastructure Failure	Facilities	Medium	1,2	$3,000	HMGP, PDM, Local	One Year	Not started, lack of funding
Albert-1	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices.	All Hazards	City Administrator	High	3	Staff Time	Local	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Albert-2	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Administrator	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Albert-3	Construct and encourage the construction of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	All Hazards	City Administrator	High	1,2	Unknown	Local, State, Federal	Continuous	Not started, lack of funding
Albert-4	Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	City Administrator	High	1,2	Unknown	Local	Five years	Not started, lack of funding
Albert-5	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Administrator	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Albert-6	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues..	Terrorism/ Agri-Terrorism	City Administrator	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Albert-7	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	City Administrator	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Albert-8	Develop and implement a wildfire prevention / education program.	Wildfire	City Administrator	Medium	3	500 per workshop	Local, State	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Albert-9	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	City Administrator	Medium	1,2	Staff Time	Local	Four years	Not started, lack of funding
Claflin-1	The City is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	City Administrator	High	1,2	None	Local, State, Federal	Continuous	Not started, lack of funding
Claflin-2	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP**	Flood (**NFIP**)	City Administrator	High	3	None	Local, State, Federal	Continuous	Not started, lack of funding
Claflin-3	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices.	All Hazards	City Administrator	High	3	None	Local	Continuous	Not started, lack of funding
Claflin-4	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Administrator	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Claflin-5	Seek funding and construct safe rooms for the residents of Claflin.	Tornado, Windstorm	City Clerk	High	1,2	$250,000	Local, State, Federal	Two years	Not started, lack of funding
Claflin-6	Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	City Administrator	High	1,2	$60,000	Local	Five years	Not started, lack of funding
Claflin-7	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Administrator	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Claflin-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and	Terrorism/ Agri-Terrorism	City Administrator	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	develop and implement plans to address these issues.								
Claflin-9	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	City Administrator	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Claflin-10	Develop and implement a wildfire prevention / education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Claflin-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	City Administrator	Medium	1,2	Staff Time	Local	Four years	Not started, lack of funding
Claflin-12	Acquire and install emergency generator for shelter.	Tornado, Utility/ Infrastructure Failure, Windstorm, Winter Storm	City Clerk	High	1,2	$5,000	Local, State, Federal	One year	Not started, lack of funding
Claflin-13	Repair existing tornado warning sirens. They are old and need to also add Not started, lack of funding ones. Would like to purchase 1 or 2 Not started, lack of funding sirens and replace existing sirens.	All Hazards	City Clerk	High	1,2	$8,000	Local, State, Federal	Three years	Not started, lack of funding
Claflin-14	ID methods of assistance for hazard mitigation plan. Will need financial assistance for completion of these projects. Would like to id and seek additional methods of financial and technical assistance for hazard mitigation projects.	All Hazards	City Clerk	Medium	1,2,3,4	$3,000	Local, State, Federal	Three years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Claflin-15	Replace water lines that may be damaged.	Utility/ Infrastructure Failure	City Clerk	Low	1,2	$100,000	Local, State, Federal	Three years	1,000 feet
Ellinwood-1	The City is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	City Administrator	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Ellinwood-2	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP**	Flood (**NFIP**)	City Administrator	High	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Ellinwood-3	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices.	All Hazards	City Administrator	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Ellinwood-4	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Administrator	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Ellinwood-5	Encourage the construction and building of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	All Hazards	City Administrator	High	1,2	$500,000	Local, State, Federal	Continuous	Not started, lack of funding
Ellinwood-6	Seek funding to procure and install Not started, lack of funding warning sirens in the city.	All Hazards	City Administrator	High	1,2	$60,000	Local	Five years	Not started, lack of funding
Ellinwood-7	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Administrator	High	3	Staff time	State, Federal	Continuous	Not started, lack of funding
Ellinwood-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/							

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Agri-Terrorism	City Administrator	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding		
Ellinwood-9	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	City Administrator	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Ellinwood-10	Develop and implement a wildfire prevention / education program.	Wildfire	City Administrator	Medium	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Ellinwood-11	Evaluate and continue to test tornado and fire sirens, including emergency generators and stormwater pumps on a routine basis to ensure operability. Seek grant funding to maintain, upgrade, and install systems on an as-needed basis.	All Hazards	City Administrator	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Ellinwood-12	The City of Ellinwood will initiate a maintenance and replacement program for sewer system upgrades and manholes as part of stormwater management.	Flood (**NFIP**)	City Administrator	Medium	1,2	$300,000	Local, State, Federal	Four years	Not started, lack of funding
Ellinwood-13	Identify Flood (**NFIP**) prone areas to consider Flood (**NFIP**) reduction measures to city planners	Flood (**NFIP**)	City Administrator	High	1,2	Staff Time	Local	Four years	Not started, lack of funding
Ellinwood-14	Develop a program to acquire and preserve parcels of land subject to repetitive flood from willing and voluntary property owners.	Flood (**NFIP**)	City Administrator	Low	1,2	Dependent on number of properties.	Local, State, Federal	Four years	Not started, lack of funding
Ellinwood-15	Continue the evaluation of the jurisdiction's emergency response services to identify future needs or shortfalls in terms of personnel, equipment or required resources.	All Hazards	City Administrator	Medium	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Ellinwood-16	Review existing public shelters and recommend Not started, lack of funding locations if and where there are coverage gaps. Include provisions for special needs populations in shelter expansion and improvement plans. .	All Hazards	City Administrator	Low	1,2	Unknown	Local	Four years	Not started, lack of funding
Ellinwood-17	Continue to incorporate the inspection and management of trees that may pose a threat to the city's routine maintenance system process.	All Hazards	City Administrator	Medium	1,2	$5,000	Local	Four years	Not started, lack of funding
Ellinwood-18	Establish a local reserve fund for repairing and/or incorporating hazard mitigation measures for public facilities and infrastructure damaged by natural hazards including preventative programs designed to reduce exposure to severe weather events.	All Hazards	City Administrator	Low	1,2,3,4	Staff Time	Local	Four years	Not started, lack of funding
Ellinwood-19	Research and install a lift station in conjunction with the sewer maintenance program. Storm drainage may be enhanced with additional capability to move large quantities of water during heavy rain events. The city will consider conducting an engineering study and seeking funds to purchase and install a lift station.	Flood (**NFIP**)	City Administrator	High	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding
Galatia-1	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP** Flood insurance policies protect property owners by offering affordable rates for protecting both structures and contents.	Flood (**NFIP**)	City Administrator	High	1,2,3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Galatia-2	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the	All Hazards	City Administrator	High	3	Staff Time	Local	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	library and routinely visited jurisdictional offices.								
Galatia-3	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Administrator	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Galatia-4	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	All Hazards	City Administrator	High	1,2	$300,000	Local, State, Federal	Continuous	Not started, lack of funding
Galatia-5	Seek funding to procure and install Not started, lack of funding warning sirens	All Hazards	City Administrator	High	1,2	$60,000	Local	Five years	Not started, lack of funding
Galatia-6	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Administrator	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Galatia-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism	City Administrator	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Galatia-8	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	City Administrator	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Galatia-9	Develop and implement a wildfire prevention / education program.	Wildfire	Fire Chief	Medium	4	$500 per workshop	Local, State	Continuous	Not started, lack of funding
Galatia-10	Research and pursue funding for the purchase and installation of alternative	All Hazards	City Administrator	High	1,2,3	$60,000	Local, State, Federal	Four years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	forms of a public warning mass notification system.								
Great Bend-1	The City is committed to continued participation and compliance with the **NFIP**. .	Flood (**NFIP**)	City Administrator	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Great Bend-2	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP**	Flood (**NFIP**)	City Administrator	High	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Great Bend-3	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices.	All Hazards	City Administrator	Medium	3	Staff Time	Local	Continuous	Not started, lack of funding
Great Bend-4	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Administrator	Medium	3	$300 per workshop	Local	Continuous	Not started, lack of funding
Great Bend-5	Encourage and construct safe rooms and storm shelters in new city facilities, public and private schools, day care centers and senior care facilities.	All Hazards	City Administrator	High	1,2	$1,000,000	Local, State, Federal	Continuous	Not started, lack of funding
Great Bend-6	Seek funding to procure and install Not started, lack of funding warning sirens in accordance with the plan recommendations.	All Hazards	City Administrator	Medium	1,2	$75,000	Local	Five years	Not started, lack of funding
Great Bend-7	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	Public Information	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Great Bend-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism	City Administrator	Medium	3	$5,000	Local, State, Federal	Four years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Great Bend-9	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/Infrastructure Failure	City Administrator	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Great Bend-10	Develop and implement a wildfire prevention / education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Great Bend-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners. .	Flood (**NFIP**)	City Administrator	Medium	1,2	Dependent on findings	Local	Four years	Not started, lack of funding
Great Bend-12	Continue routine outdoor storm warning siren testing to enhance citizen awareness.	Tornado, Windstorm	City Administrator	Medium	1,2,3,4	Staff Time	Local	Continuous	Not started, lack of funding
Great Bend-13	Continue to review and update the city's Stormwater Management Plan and Drainage Permit on an annual basis.	Flood (**NFIP**)	City Administrator	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Great Bend-14	Complete the current sewer reconstruction project. This project is designed to facilitate better drainage in the city to prevent flash Flood in the streets, storm drains, and waterbodies within or near the city limits.	Flood (**NFIP**), utility/infrastructure failure	City Administrator	High	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding
Great Bend-15	Conduct an inventory/survey for the jurisdiction's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.	All Hazards	Fire Chief	Medium	1,2	Staff Time	Local, State, Federal	Five years	Updated
Great Bend-16	Continue the weekly test of the backup generator at the City EOC.	Utility/Infrastructure Failure	City Administrator	High	1,2,3,4	Staff Time	Local	Continuous	Not started, lack of funding
Great Bend-17	The city of Great Bend will maintain the city levee system in accordance with	Dam and Levee Failure	City Administrator	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	current operations and maintenance programs.								
Great Bend-18	Investigate development of a logistics staging center for the city of Great Bend.	All Hazards	City Administrator	Medium	1,2	$100,00	Local, State, Federal	Four years	Not started, lack of funding
Great Bend-19	Specific education programs should be developed in coordination with the KS Animal Health Department to inform ranchers, farmers, and bets on the methods to identify, prevent, and treat animal disease out breaks.	Terrorism/ Agri-Terrorism	Fire Chief	Medium	3	$5,000	Local, State, Federal	Continuous	Not started, lack of funding
Great Bend-18	The City will develop a long-term engineering plan to address stormwater runoff and detention issues.	Flood	City Administrator	High	1,2	$150,000	Local, State, Federal	Five years	New
Great Bend-18	The City will purchase and install discharge pumps at Veteran's Lake and Suchy Lake to lower water levels to accommodate runoff from large rain events.	Flood	City Administrator	High	1,2	$100,000	Local, State, Federal	Five years	New
Great Bend-18	The City will continue street maintenance programs, with an emphasis on improving surface drainage.	Flood	City Administrator	High	1,2	$1,000,000	Local, State, Federal	Five years	New
Great Bend-18	The City will continue to repair and or replace drop inlets and storm box/pipes, with adequate pipe sizing to accommodate heavy rain events.	Flood	City Administrator	High	1,2	$5,000,000	Local, State, Federal	Five years	New
Great Bend-18	The City will clean, survey and provide proper grade and slop and then maintain open ditches and culverts, city-wide, to allow for proper discharge of surface water runoff.	Flood	City Administrator	High	1,2	$750,000	Local, State, Federal	Five years	New
Hoisington-1	The City is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	City Manager	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hoisington-2	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP**	Flood (**NFIP**)	City Manager	High	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Hoisington-3	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices.	All Hazards	City Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Hoisington-4	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Manager	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Hoisington-5	Encourage the construction of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities, and underserved portions of our community.	All Hazards	City Manager	High	1,2	$1,000,000	Local, State, Federal	Continuous	Updated
Hoisington-6	Warning Sirens Plan and Project - Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	City Manager	High	1,2	$75,000 - $100,000	Local, State, Federal	Five years	Updated
Hoisington-7	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Hoisington-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism	City Manager	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hoisington-9	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/Infrastructure Failure	City Manager	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Hoisington-10	Develop and implement a wildfire prevention / education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Hoisington-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	City Manager	Medium	1,2	None	Local	Four years	Not started, lack of funding
Hoisington-12	Continue routine outdoor storm warning siren testing to enhance citizen awareness.	Tornado, Windstorm	City Manager	Medium	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Hoisington-13	Complete a storm sewer modernization and expansion project for Hoisington.	Flood (**NFIP**)	City Manager	High	1,2	$250,000	Local, State, Federal	Four years	Not started, lack of funding
Hoisington-14	Conduct an inventory/survey for the jurisdiction's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.	All Hazards	City Manager	Medium	1,2,3,4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Hoisington-15	Flood (**NFIP**) Mitigation Project. Local development is being severely hindered due to Floodplain designations and Flood (**NFIP**) hazards. Research and implement a plan to place Flood (**NFIP**) detention facilities on the north end of town. These ponds may help to mitigate Flood (**NFIP**) risks for all residents and also help create development opportunities.	Flood (**NFIP**)	City Manager	High	1,2	$100,000 - $1,000,000 for plan and implementation	Local, State, Federal	Ten years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Olmitz-1	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP**	Flood (**NFIP**)	City Manager	High	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Olmitz-2	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices.	All Hazards	City Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Olmitz-3	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Manager	Medium	3	$250 per workshop	Local	Continuous	Not started, lack of funding
Olmitz-4	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	All Hazards	City Manager	High	1,2	$300,000	Local, State, Federal	Continuous	Not started, lack of funding
Olmitz-5	Seek funding to procure and install Not started, lack of funding warning sirens.	All Hazards	City Manager	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Olmitz-6	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Olmitz-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism	City Manager	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Olmitz-8	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to	Utility/Infrastr ucture Failure	City Manager	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	these hazards, and identification of mitigation strategies								
Olmitz-9	Develop and implement a wildfire prevention / education program.	Wildfire	Fire Chief	Medium	4	Staff Time	Local, State	Continuous	Not started, lack of funding
Olmitz-10	Research and pursue funding for the purchase and installation of alternative forms of a public warning mass notification system.	All Hazards	City Manager	High	1,2	$50,000	Local, State, Federal	Four years	Not started, lack of funding
PawneeRock-1	The City is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	City Manager	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
PawneeRock-2	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP**	Flood (**NFIP**)	City Manager	High	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
PawneeRock-3	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices.	All Hazards	City Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
PawneeRock-4	Host a public “hazards workshop” in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Manager	Medium	3	$300 per workshop	Local	Continuous	Not started, lack of funding
PawneeRock-5	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	All Hazards	City Manager	High	1,2	$300,000	Local, State, Federal	Continuous	Not started, lack of funding
PawneeRock-6	Seek funding to purchase and install Not started, lack of funding warning sirens.	All Hazards	City Manager	High	1,2	$45,000	Local	Five years	Not started, lack of funding
PawneeRock-7	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
PawneeRock-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism	City Manager	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
PawneeRock-9	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/Infrastructure Failure	City Manager	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
PawneeRock-10	Develop and implement a wildfire prevention / education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local, State	Continuous	Not started, lack of funding
PawneeRock-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners. Flood (**NFIP**) zone mapping has provided initial identification of potential hazard areas that can be reviewed with other data sources, such as the watershed districts goals and objectives, in developing long range planning activities for Flood (**NFIP**) prevention, or other planning steps to reduce exposure to this hazard.	Flood (**NFIP**)	City Manager	Medium	Dependent on findings	None	Local	Four years	Not started, lack of funding
Susank-1	The City is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	City Manager	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Susank-2	Advertise and promote the availability of Flood insurance to property owners by direct mail once a year. **NFIP**	Flood (**NFIP**)	City Manager	High	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Susank-3	Collect educational materials on individual and family preparedness/mitigation measures for property owners, and display at both the library and routinely visited jurisdictional offices. .	All Hazards	City Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Susank-4	Host a public "hazards workshop" in combination with an established jurisdictional event drawing large crowds.	All Hazards	City Manager	Medium	3	$250 per workshop	Local	Continuous	Not started, lack of funding
Susank-5	Encourage and construct of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	All Hazards	City Manager	High	1,2	$300,000	Local, State, Federal	Continuous	Not started, lack of funding
Susank-6	Seek funding to purchase and install Not started, lack of funding warning sirens.	All Hazards	City Manager	High	1,2	$60,000	Local	Five years	Not started, lack of funding
Susank-7	Educate residents about driving in winter storms and handling winter-related health effects.	All Hazards	City Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Susank-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism	City Manager	Medium	3	Staff Time	Local, State, Federal	Four years	Not started, lack of funding
Susank-9	Coordinate mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/Infrastr ucture Failure	City Manager	Medium	4	Staff Time	Local, State, Federal	Four years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Susank-10	Develop and implement a wildfire prevention / education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Susank-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	City Manager	Medium	1,2	Dependent on findings	Local	Four years	Not started, lack of funding
Barton County Community College-1	Develop and implement an emergency notification system for campus facilities.	All Hazards	President	Medium	1,2	$50,000	Local, State, Federal	Four years	On-going, have added RAVE and internal intercom system, however additional options need to be researched
USD#112-1	Construct tornado safe rooms for all USD 112 schools.	Tornado, Windstorm	Superintendent	Medium	1,2	$1,000,000	Federal	Four years	Not started, lack of funding
USD#355-1	Construct tornado safe rooms in all USD 355 district schools.	Tornado, Windstorm	Superintendent	Medium	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding
USD#355-2	Seek funding to retain a professional to review and update the school's security plan for domestic violence, building security, and contagious disease response.	Civil Disorder, Terrorism/ Agri-Terrorism	Superintendent	Low	1,2	$50,000	Local, State, Federal	Four years	Not started, lack of funding
USD#355-3	Develop and fund mitigation projects to purchase and install backup generators for USD 355 facilities.	Utility/Infrastructure Failure	Superintendent	Low	1,2	$60,000	Local, State, Federal	Four years	Not started, lack of funding
USD#428-1	Construct safe rooms in all USD 428 buildings.	Tornado, Windstorm	Superintendent	Medium	1,2	$3,00,000	Federal	Four years	Not started, lack of funding
USD#431-1	Construct tornado safe rooms in all USD431 buildings.	Tornado, Windstorm	Superintendent	Medium	1,2	$1,000,000	Local, State, Federal	Five years	Updated

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Ark Valley REC-1	Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer economically feasible to use. Reconductor existing copper-weld lines with aluminum steel reinforced conductor and replace poles as needed.	Utility/ Infrastructure Failure	Director	High	1,2	$400,000	Local, State, Federal	Five years	Not started, lack of funding
Midwest Energy-1	ACSR Conductor. Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer economically feasible to use. Reconductor existing copper-weld lines with aluminum steel reinforced conductor and replace poles as needed.	Utility/ Infrastructure Failure	Director	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Rolling Hills REC-1	ACSR Conductor. Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer economically feasible to use. Reconductor existing copper-weld lines with aluminum steel reinforced conductor and replace poles as needed.	Utility/ Infrastructure Failure	Director	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Rolling Hills REC-2	Upgrade and Enhanced Power lines. Replacement of CWC single-phase line of enhanced design. The miles of line selected will meet several points of prioritization and evaluation and represent a small percentage of total CWC miles in the rural electric	Utility / Infrastructure Failure	Director	High	1,2	$2,000,000	HMGP, PDM, Local, Other Grants	Four years	Not started, lack of funding

Table 6.5: Barton County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	distribution system. Replacing the lines would significantly mitigate losses due to damages and greatly enhance reliability in the surrounding areas. The aged CWC construction has sustained much damage over the years and was not built to current and acceptable standards.								
Post Rock Rural Water District #1-1	Replace existing waterlines in jeopardy of being damaged due to expansive soils communication towers and SCADA controlled water towers protection	Expansive Soil	Director	Medium	1,2	$1,000,000	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Post Rock Rural Water District #1-2	Acquire a permanent back-up generators for all Rural Water District No. 1 facilities.	Utility/ Infrastructure Failure	Director	Medium	1,2	$250,000 each	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding
Post Rock Rural Water District #1-3	Commission an Army Corps of Engineers action plan for all applicable dams.	Dam Failure	Director	Low	1,2	$125,000	Federal Grants	Five years	Not started, lack of funding
Post Rock Rural Water District #1-4	Install lightening prevention measures to decrease the radio equipment damages caused by lightning.	Lightning	Director	Medium	1,2	$7,000 per unit	HMGP, PDM Grant, Local Budget, Grants	Five years	Not started, lack of funding

6.8.3 – Comanche County and Participating Jurisdictions Mitigation Actions

Table 6.6: Comanche County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Comanche County-1	Install/Upgrade Siren Warning Systems.	Tornado	Emergency Manager	high	1,2	$75,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.6: Comanche County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Comanche County-2	Improve public awareness of hazard risks through education.	All Hazards	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Comanche County-3	Enforce burning regulations	Wildfire	Fire chief	High	1,2,3,4	Staff Time	Local	Continuous	Not started, lack of funding
Comanche County-5	Obtain more information on expansive soils, including complete a count-wide map, for future plan updates.	Expansive Soils	Emergency Manager	Medium	1,2,4	Staff Time	Local	Five years	Not started, lack of funding
Comanche County-6	Maintain list of storm shelters in the county (public and private)	Tornado	Emergency Manager	Medium	1,2,3,4	Staff Time	Local	Five years	Not started, lack of funding
Comanche County-7	Encourage businesses and citizens to use smoke detectors	Wildfire	Fire chief	Medium	3	Staff Time	Local	Five years	Not started, lack of funding
Comanche County-8	Support/Conduct EMS and first responders training on a monthly basis	All Hazards	Emergency Manager	Medium	4	Staff Time	Local	Continuous	Not started, lack of funding
Comanche County-9	Distribute weather radios to vulnerable populations.	All Hazards	Emergency Manager	High	1,2,3	$5,000	Local	Continuous	Not started, lack of funding
Comanche County-10	Maintain a list of people on oxygen and other special needs.	All Hazards	Emergency Manager	high	2	Staff Time	Local	Continuous	Not started, lack of funding
Comanche County-11	Develop an evacuation plan.	Flood (**NFIP**), Hazardous Materials, Radiological, Wildfire	Emergency Manager	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Comanche County-12	Develop a debris Management Plan.	Agriculture Infestation, Flood (**NFIP**), Tornado, Windstorm, Winter Storm	Emergency Manager	High	1,2	Staff Time	Local	Five years	Not started, lack of funding

Table 6.6: Comanche County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Comanche County-13	Develop/Update Emergency Response Plan	All Hazards	Emergency Manager	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Comanche County-14	Install/Upgrade Communications for Emergency Responders	All Hazards	Emergency Manager	High	1,2,4	$20,000	Local, State, Federal	Five years	Not started, lack of funding
Comanche County-15	Establish back-up communications systems	All Hazards	Emergency Manager	High	4	$10,000	Local, State, Federal	Five years	Not started, lack of funding
Coldwater-1	Install/Upgrade Siren Warning Systems.	Tornado	Mayor	High	1,2	$60,000	Local, State, Federal	Five years	Not started, lack of funding
Coldwater-2	Improve public awareness of hazard risks through education	All Hazards	Mayor	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Coldwater-3	Enforce Burning Regulations	Wildfire	Fire chief	High	1,2,3	Staff Time	Local	Continuous	Not started, lack of funding
Coldwater-4	Purchase/Install backup generators for critical facilities	Utility/ Infrastructure Failure	Mayor	High	2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Coldwater-5	Construct Community tornado shelter	Tornado, Windstorm	Mayor	High	1,2	$350,000	Local, State, Federal	Five years	Not started, lack of funding
Protection-1	Continue to comply with the **NFIP** regulations by enforcing Floodplain management regulations	Flood (**NFIP**)	Mayor	High	1,2	Staff Time	NA	Continuous	Not started, lack of funding
Protection-2	Install/Upgrade Siren Warning Systems.	Tornado	Mayor	High	1,2	$60,000	Local, State, Federal	Five years	Not started, lack of funding
Protection-3	Improve public awareness of hazard risks through education	All Hazards	Mayor	High	3	Staff Time	NA	Continuous	Not started, lack of funding

Table 6.6: Comanche County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Protection-4	Enforce burning regulations	Wildfire	Fire chief	High	1,2,3	Staff Time	NA	Continuous	Not started, lack of funding
Protection-5	Update disaster and recovery plan	All Hazards	Mayor	High	1,2	Staff Time	NA	Five years	Not started, lack of funding
Protection-6	Update Mutual Aid Agreements	All Hazards	Mayor	High	1,2	Staff Time	NA	Five years	Not started, lack of funding
Protection-7	Elevation or relocation of structures in Flood (**NFIP**) vulnerable areas	Flood (**NFIP**)	Mayor	High	1,2	Pending number of structures that participate	Local, State, Federal	Ten years	Not started, lack of funding
Wilmore-1	Improve public awareness of hazard risks through education	All Hazards	Mayor	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Wilmore-2	Maintain list of storm shelters in the county (public and private)	Tornado	Mayor	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Wilmore-3	Encourage businesses and citizens to use smoke detectors	Wildfire	Fire chief	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Wilmore-4	Support/Conduct EMS and first responders training on a monthly basis	All Hazards	Mayor	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Wilmore-5	Development an evacuation plan	Flood (**NFIP**), Hazardous Materials, Radiological, Wildfire	Mayor	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Wilmore-6	Purchase and install Not started, lack of funding fire hydrants	Wildfire	Fire chief	High	1,2	$75,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.6: Comanche County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Wilmore-7	Purchase/Install backup generators for critical facilities	Utility/ Infrastructure Failure	Mayor	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Wilmore-8	Construct a Community tornado shelter	Tornado, Windstorm	Mayor	High	1,2	$350,000	Local, State, Federal	Five years	Not started, lack of funding
USD#300-1	Improve public awareness of hazard risks through education	All Hazards	Superintendent	High	3	Staff Time	Local	Continuous	Not started, lack of funding
USD#300-2	Continue to conduct monthly fire drills at schools	Wildfire	Superintendent	High	1,2,3,4	Staff Time	Local	Continuous	Not started, lack of funding
USD#300-3	Construct tornado safe rooms in all USD 300 schools.	Tornado	Superintendent	High	1,2,3,4	Staff Time	Local	Continuous	Not started, lack of funding
USD#300-4	Purchase/Install backup generator all USD 300 schools.	Tornado, Windstorm, Utility/ Infrastructure Failure	Superintendent	High	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD#300-5	Construct FEMA approved safe room in each school building	Tornado, Windstorm	Superintendent	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
CMS Electric Cooperative-1	Conduct the Comanche County Reconductor Project	Utility/ Infrastructure Failure, Winter Storms, Windstorms, Tornado	Director	High	1,2	Unknown	Local, State, Federal	Five years	Not started, lack of funding
Southern Pioneer REC-1	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,160,000	Local, State, Federal	Four years	Not started, lack of funding
Southern Pioneer REC-2	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$10,000 t $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding

6.8.4– Edwards County and Participating Jurisdictions Mitigation Actions

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Edwards County-1	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Edwards County-2	Identify the county's most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible.	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-3	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Edwards County-5	Encourage the construction of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Edwards County-6	Educate residents about driving in winter storms and handling winter-related health effects	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Edwards County-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues	Terrorism/							

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	that can severely impact the county and regional economies, and develop and implement plans to address these issues..								
Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Five years	On-going		
Edwards County-8	Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-9	Work with county and city leaders in developing standardized procedures for identifying shelters as pre-disaster tornado shelters and post-disaster shelters. Develop "Memorandums of Understanding" (MOUs) with facility owners.	Tornado, Windstorm	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-10	The County and local government will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	4	Staff Time	Local, State	Five years	Not started, lack of funding
Edwards County-11	Develop cross-departmental information collection capabilities, and incorporate (building/parcel) data utilizing a Geographic Information System (GIS) for purposes of conducting more detailed hazard risk assessments and for tracking permitting / land use patterns, buildings and	All Hazards	Planner, Appraiser, GIS	Medium	4	Staff Time	Local	Five years	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	infrastructure replacement costs, and overall structural accounting for the Jurisdiction.								
Edwards County-12	Conduct an inventory/survey for the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.	All Hazards	Emergency Manager	High	1,2,3,4	Staff Time	Local, State	Five years	Not started, lack of funding
Edwards County-13	Research and recommend an ordinance/resolution to require installation of tornado shelters for major manufactured and/or mobile home parks with more than 10 mobile home spaces.	Tornado, Windstorm	Planner	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-14	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local	Continuous	Not started, lack of funding
Edwards County-15	Examine the current agreements within the county and assess the need to expand or update cooperative agreements for firefighting resources. Include agreements with local, state and federal agencies.	Wildfire	Fire Chief	High	4	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-16	Create a working group to evaluate the firefighting water supply resources within the County. This should include both fixed and mobile supply issues.	Wildfire	Fire Chief	Medium	4	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-17	Research and recommend appropriate building codes for the Jurisdiction that includes wind-resistant design techniques for Not started, lack of funding construction	Tornado, Windstorm	Planner	high	1,2	Staff Time	Local	Five years	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Edwards County-18	Encourage the repositioning of as many utility lines as possible underground.	Utility/ Infrastructure Failure	Director of Public Works	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Edwards County-19	Pawnee Watershed Joint District No. 81 will continue to monitor the potential impact from natural hazards on the jurisdiction and make changes as necessary.	Utility/ Infrastructure Failure	Director	High	1,2,4	Staff Time	Local	Five years	Not started, lack of funding
Belpre-1	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices	All Hazards	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Belpre-2	Identify the City's most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible.	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Five years	Not started, lack of funding
Belpre-3	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Belpre-4	Annually host a public “hazards workshop” in combination with local festivals, fairs, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Belpre-5	Encourage the construction of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Belpre-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Belpre-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues..	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Five years	On-going
Belpre-8	Prepare and adopt an Outdoor Warning Sirens Plan, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	Medium	1,2	$75,000	Local	Five years	Not started, lack of funding
Belpre-9	Work with county and city leaders in developing standardized procedures for identifying shelters as pre-disaster tornado shelters and post-disaster shelters. Develop "Memorandums of Understanding" (MOUs) with facility owners.	Tornado, Windstorm	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Belpre-10	The County and local government will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	4	Staff Time	Local, State	Five years	Not started, lack of funding
Belpre-11	Seek funding to retain an engineer to design a community tornado shelter and apply for grant funding for construction.	Tornado	Mayor	Low	1,2	$350,000	FEMA	Five years	Not started, lack of funding
Belpre-12	Promote the use of NOAA All Hazards Weather Radios for the entire community of Belpre. Seek funding to subsidize purchase and distribution of weather radios.	All Hazards	Mayor	Medium	1,2	$8,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kinsley-1	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices	All Hazards	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Kinsley-2	Identify the City's most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible.	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Five years	Not started, lack of funding
Kinsley-3	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Kinsley-4	Annually host a public “hazards workshop” in combination with local festivals, fairs, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Kinsley-5	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Continuous	Not started, lack of funding
Kinsley-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Kinsley-7	Promote and educate the jurisdiction’s public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Five years	On-going

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kinsley-8	Prepare and adopt an Outdoor Warning Sirens Plan, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	Medium	1,2	$75,000	Local	Five years	Not started, lack of funding
Kinsley-9	Work with county and city leaders in developing standardized procedures for identifying shelters as pre-disaster tornado shelters and post-disaster shelters. Develop "Memorandums of Understanding" (MOUs) with facility owners.	Tornado, Windstorm	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Kinsley-10	The County and local government will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	4	Staff Time	Local, State	Five years	Not started, lack of funding
Kinsley-11	The City of Kinsley is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	City Manager	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Kinsley-12	Identify Flood (**NFIP**) prone areas to consider future Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	City Manager	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Kinsley-13	Seek funding to complete a stormwater drainage study/plan for the City of Kinsley that will lead to a stormwater management ordinance.	Flood (**NFIP**)	City Manager	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Kinsley-14	Seek funding to perform improvements to minimize Flood (**NFIP**) damage to existing development by maximizing the effectiveness of the storm sewer infrastructure.	Flood (**NFIP**)	City Manager	Low	1,2	$150,000	Local, State, Federal	Five years	Not started, lack of funding
Kinsley-15	Seek funding for the purchase and installation of backup power sources for critical facilities in the city of Kinsley.	Utility/ Infrastructure Failure	City Manager	Low	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Lewis-1	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Lewis-2	Identify the City's most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible.	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Five years	Not started, lack of funding
Lewis-3	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Lewis-4	Annually host a public “hazards workshop” in combination with local festivals, fairs, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$250 per workshop	Local	Continuous	Not started, lack of funding
Lewis-5	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$300,000	Local, State, Federal	Continuous	Not started, lack of funding
Lewis-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Lewis-7	Promote and educate the jurisdiction’s public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Five years	On-going

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Lewis-8	Prepare and adopt an Outdoor Warning Sirens Plan, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	Medium	1,2,4	$45,000	Local	Five years	Not started, lack of funding
Lewis-9	Work with county and city leaders in developing standardized procedures for identifying shelters as pre-disaster tornado shelters and post-disaster shelters. Develop "Memorandums of Understanding" (MOUs) with facility owners.	Tornado, Windstorm	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Lewis-10	The County and local government will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	4	Staff Time	Local, State	Five years	Not started, lack of funding
Lewis-11	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during inclement weather.	All Hazards	Mayor	Medium	1,2	$60,000	Local, State, Federal	Five years	Not started, lack of funding
Lewis-12	Seek funding to retain an engineer to design a community tornado shelter and apply for grant funding for construction	Tornado	Mitigation Officer, Zoning Administrator	Low	1,2	$40,000	FEMA	Five years	Not started, lack of funding
Offerle-1	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Offerle-2	Identify the City's most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible.	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Five years	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Offerle-3	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding
Offerle-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate events.	All Hazards	Emergency Manager	Medium	1,2	$500 per workshop	Local	Continuous	Not started, lack of funding
Offerle-5	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Continuous	Not started, lack of funding
Offerle-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Offerle-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Five years	On-going
Offerle-8	Prepare and adopt an Outdoor Warning Sirens Plan, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	Medium	1,2	$60,000	Local	Five years	Not started, lack of funding
Offerle-9	Work with county and city leaders in developing standardized procedures for identifying shelters as pre-disaster tornado shelters and post-disaster shelters. Develop "Memorandums of	Tornado, Windstorm	Emergency Manager	High	4	Staff Time	Local	Five years	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	Understanding" (MOUs) with facility owners.								
Offerle-10	The County and local government will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	1,2,3,4	Staff Time	Local, State	Five years	Not started, lack of funding
Offerle-11	Promote the use of NOAA All Hazards Weather Radios for the entire community of Offerle. Seek funding to subsidize purchase and distribution of weather radios. .	All Hazards	Mayor	Medium	1,2	$8,000	Local, State, Federal	Five years	Not started, lack of funding
Offerle-12	Seek funding to retain an engineer to design a community tornado shelter and apply for grant funding for construction.	Tornado	Mayor	Low	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
USD#347-1	Develop and fund mitigation projects for the construction of tornado safe rooms for Unified School District 347 schools.	Tornado	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD#347-2	Seek funding for the purchase and installation of backup power sources in USD 347 facilities.	Utility/ Infrastructure Failure	Superintendent	Low	1,2	$40,000	Local, State, Federal	Four years	Not started, lack of funding
USD#347-3	Seek funding to evaluate and update the existing Emergency Plan for technical hazards impacted by severe weather.	All Hazards	Superintendent	High	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding
USD#502-1	Develop and fund mitigation projects for the construction of tornado safe rooms for Unified School District 502 schools.	Tornado	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD#502-2	Seek funding for the purchase and installation of backup power sources in USD 502 facilities.	Utility/ Infrastructure Failure	Superintendent	Low	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
MidWest Energy-1	ACSR Conductor. Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer	Utility/ Infrastructure Failure	Director	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.7: Edwards County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	economically feasible to use. Reconductor existing copper-weld lines with aluminum steel reinforced conductor and replace poles as needed.								
Ninnescah REC-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Ninnescah REC-	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding
Pawnee Watershed Joint District No. 81 -11	Pawnee Watershed Joint District No. 81 will continue to monitor the potential impact from natural hazards on the jurisdiction and make changes as necessary.	Utility/ Infrastructure Failure	Director	High	1,2,4	Staff Time	Local	Five years	Not started, lack of funding

6.8.5 – Kiowa County and Participating Jurisdictions Mitigation Actions

Table 6.8: Kiowa County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kiowa County-1	Distribute Weather Radios.	All Hazards	Emergency Manager	High	1,2	$30 per radio	Local, NWS Grant	Three years	Not started, lack of funding
Kiowa County-2	Increase Tornado Spotter and Other Weather Training Opportunities.	All Hazards	Emergency Manager	High	1,2,3,4	$2,400	Local, NWS Grant	Annually	Not started, lack of funding
Kiowa County-3	Become a StormReady Community.	All Hazards	Emergency Manager	high	1,2	$6,000	Staff Time	Within Five years	Not started, lack of funding
Kiowa County-4	Provide Back-Up Generators for Community Shelters.	Utility/ Infrastructure Failure	Emergency Manager	High	1,2	Unknown	Staff Time, Local, State, Federal	Within Five years	Not started, lack of funding
Kiowa County-5	Develop/incorporate Text Message Alert System from National Weather Service.	All Hazards	Emergency Manager	High	1,2,3,4	Unknown	Staff Time, Local	Within Five years	Not started, lack of funding
Kiowa County-6	Develop Annual Public Education Campaign (seasonal).	All Hazards	Fire Chief, Emergency Manager, PIO	Medium	3	$5,000 - $20,000	Local	Annually	Not started, lack of funding
Kiowa County-7	Increase public and fire department training on wildland urban interface fires.	Wildfire	Fire Chief	Medium	3,4	$30 per student per tng session	KS Forest Svc, State, Federal, Local	Continuous	Not started, lack of funding
Kiowa County-8	Reduce hazardous fuels in prioritized wildfire risk areas.	Wildfire	Fire Chief	Medium	1,2	$85/ac	KS Forest Svc, State, Federal, Local	Continuous	Not started, lack of funding
Kiowa County-9	Provide homeowner education on wildfire mitigation in wildland-urban interface.	Wildfire	Fire Chief	Medium	3	$500	KS Forest Svc, State, Federal, Local	Continuous	Not started, lack of funding

Table 6.8: Kiowa County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kiowa County-10	Identify Vulnerable Populations within Community. Vulnerable Populations within Kiowa County lack the ability and/or the means to respond to emergencies.	All Hazards	Emergency Manager	Medium	2	$12,000	Local, Staff Time	Three years	Not started, lack of funding
Kiowa County-11	Continue to comply with **NFIP** to include education the public on the **NFIP** and flood insurance.	Flood (**NFIP**)	Emergency Manager	Medium	1,2	Staff Time - $3,000	Local, Staff Time	Three years	Not started, lack of funding
Kiowa County-12	Participate in the FEMA map modernization process to develop flood insurance Rate Maps (FIRMs).	Flood (**NFIP**)	Emergency Manager	Medium	1,2,3,4	$4,800	FEMA, Staff Time	Three years	Not started, lack of funding
Kiowa County-13	Develop Drought Management plans for rural water districts.	Drought	Emergency Manager, Rural Water District Staff	Medium	1,2	$20,000 - $30,000	Local	Annually	Not started, lack of funding
Kiowa County-14	Include a tornado shelter in the Not started, lack of funding Kiowa County Road and Bridge shop and main office.	Tornado, Windstorm	Emergency Manager	High	1,2	Unknown	Local, HMGP, USDA Grant	Two years	Not started, lack of funding
Kiowa County-15	Include a tornado shelter in the Not started, lack of funding Kiowa County Memorial Hospital.	Tornado, Windstorm	Emergency Manager	High	1,2	$217,607	Local, HMGP, USDA Grant	Two years	Not started, lack of funding
Kiowa County-16	Include a tornado shelter in the Not started, lack of funding Kiowa County Museum/Library/Media Center.	Tornado, Windstorm	Emergency Manager	High	1,2	Unknown	Local, HMGP, USDA Grant	Three years	Not started, lack of funding
Greensburg-1	Assist the study contractor in preparing revised Digital Flood Insurance Rate Maps (DFIRMs) by identifying local mapping needs. (**NFIP**)	Flood (**NFIP**)	Floodplain Manager	Medium	1,2,4	$9,000	Staff Time, FEMA	Within five years	Not started, lack of funding
Greensburg-2	Continue to comply with the **NFIP** and strengthen Floodplain regulations, as appropriate, following DFIRM development.	Flood (**NFIP**)	Floodplain Manager	Medium	1,2	$600	Staff Time	Within five years	Not started, lack of funding

Table 6.8: Kiowa County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Greensburg-3	Include a tornado shelter in City Hall.	Tornado, Windstorm	Mayor	High	1,2	$38,000	Staff, Time, Local, HMGP, USDA Grants	Two years	Not started, lack of funding
Greensburg-5	Include a tornado shelter City Public Works Facility.	Tornado, Windstorm	Mayor	High	1,2	Unknown	Staff Time, Local, State, Federal	Two years	Not started, lack of funding
Haviland-1	Participate in Countywide Annual Public Education Campaign (seasonal)	All Hazards	Fire Chief, Emergency Manager, PIO	Medium	3	Low	Local	Annually	Not started, lack of funding
Haviland-2	Ion water treatment plant due to high nitrate levels. Would like to build a new ion treatment plant.	Utility/ Infrastructure Failure	City Clerk	High	1,2	$2,100,000	Local, State, Federal	Five years	Not started, lack of funding
Mullinville-1	Construct community safe room.	Tornado	Fire Chief	Medium	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Barclay College-1	Construct a tornado shelter(s) for all students and staff on campus.	Tornado, Windstorm	President	High	1,2	$750,000	Local, HMGP, USDA Grant	Three years	New
USD#422-1	Construct a tornado shelter in new and existing USD 422 buildings.	Tornado, Windstorm	Superintendent	High	1,2	$500,000 per facility	Local, HMGP, USDA Grant	Two years	Not started, lack of funding
USD#474-1	Construct a tornado shelter in new and existing USD 474 buildings.	Tornado, Windstorm	Superintendent	High	1,2	$500,000 per facility	Local, HMGP, USDA Grant	Two years	Not started, lack of funding
Haviland Care Center-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Safety Manager	High	1,2	$15,000 per unit	Local, State, Federal	Three years	New

Table 6.8: Kiowa County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Iroquois Center-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Safety Manager	High	1,2	$15,000 per unit	Local, State, Federal	Three years	New
Kiowa County Hospital-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Safety Manager	High	1,2	$15,000 per unit	Local, State, Federal	Three years	New
CMS Electric Cooperative-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
CMS Electric Cooperative-2	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding
Greensburg Municipal Electric-1	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,000,000	Local, State, Federal	Four years	New
Ninnescah REC-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Ninnescah REC-	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding
South Pioneer REC-1	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,160,000	Local, State, Federal	Four years	Not started, lack of funding
South Pioneer REC-2	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Victory Electric-1	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,000,000	Local, State, Federal	Four years	New

6.8.6– Pawnee County and Participating Jurisdictions Mitigation Actions

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pawnee County-1	Pawnee County is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	Planner	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Pawnee County-2	Advertise and promote the availability of flood insurance to property owners by direct mail on an annual basis. **(NFIP)**	Flood (**NFIP**)	Planner	High	1,2,3	Staff Time	Local	Five years	Not started, lack of funding
Pawnee County-3	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited public offices.	All Hazards	Emergency Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Pawnee County-4	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Director Road and Bridge, Director REC	High	4	Staff Time	Local	Five years	Not started, lack of funding
Pawnee County-5	Annually host a public “hazards workshop” in combination with local festivals, county fair, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$1,000 per workshop	Local	Continuous	Not started, lack of funding
Pawnee County-6	Encourage the construction of safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-7	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Pawnee County-8	Promote and educate the jurisdiction’s public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	High	3	Staff Time	Local, State, Federal	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	develop and implement plans to address these issues.								
Pawnee County-9	Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager, Planner	Medium	1,2	$75,000	Local	Five years	Not started, lack of funding
Pawnee County-10	Appoint a planning committee to research, develop, and recommend a Comprehensive Land Use Plan for the Jurisdiction.	All Hazards	Director of Planning and Zoning	Medium	1,2,3,4	Staff Time	Local	Five years	Not started, lack of funding
Pawnee County-11	The County will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Planner, Emergency Management	Medium	4	Staff Time	Local, State	Three years	Not started, lack of funding
Pawnee County-12	Develop a program in coordination with the State of Kansas Division of Emergency Management and FEMA to acquire and preserve parcels of land subject to repetitive Flood from willing and voluntary property owners.	Flood (**NFIP**)	Planner	High	4	Staff Time	State, Federal	Five years	Not started, lack of funding
Pawnee County-13	Identify the jurisdiction's most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible. A thorough evaluation of potential mitigation	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Five years	Not started, lack of funding
Pawnee County-14	Research and recommend an ordinance/resolution to require installation of tornado shelters for any major Not started, lack of funding manufactured and/or	Tornado, Windstorm	Planning and Zoning Director	High	1,2	Staff Time	Local	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	mobile home parks with more than 10 mobile home spaces.								
Pawnee County-15	Conduct an inventory/survey of the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.	All Hazards	Emergency Manager	High	1,2	Staff Time	Local, State	Five years	Not started, lack of funding
Pawnee County-16	Develop cross-departmental information collection capabilities, and incorporate (building/parcel) data utilizing a GIS for purposes of conducting more detailed hazard risk assessments and for tracking permitting / land use patterns, buildings and infrastructure replacement costs, and overall structural accounting for the county.	All Hazards	Emergency Manager, appraiser, GIS	Medium	4	Staff Time	KDEM, Local, Federal, Grants	Five years	On-going
Pawnee County-17	Encourage the repositioning of as many utility lines as possible underground.	Utility/ Infrastructure Failure	Public Works Director, Road and Bridge Director, REC Director	High	1,2	Unknown	Local	Five years	Not started, lack of funding
Pawnee County-18	Research and recommend appropriate building codes, permitting and platting ordinances for the Jurisdiction that includes wind-resistant design techniques for Not started, lack of funding construction.	All Hazards	Planner	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Pawnee County-19	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	Not started, lack of funding
Pawnee County-20	Examine the current agreements within the county and assess the need to expand or update cooperative agreements for firefighting resources.	Wildfire	Fire Chief, Emergency Manager	Medium	4	Staff Time	Local	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pawnee County-21	Create a working group to evaluate the firefighting water supply resources within the County.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,4	Staff Time	Local	Five years	Not started, lack of funding
Pawnee County-22	Distribute assessment report examples provided by the Kansas Forest Service to applicable parties to develop an understanding of the Community Wildfire Protection Plan (CWPP).	Wildfire	Fire Chief, Emergency Manager	High	1,2,3,4	Staff Time	Local, State, Federal, Grants	Five years	Not started, lack of funding
Pawnee County-23	Appoint a rural fire committee to schedule meetings with the Kansas Forest Service to map suspected hazardous wildfire areas in the county for potential participation in the Community Wildfire Protection Program (CWPP).	Wildfire	Fire Chief, Emergency Manager	High	1,2,3,4	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-24	Incorporate wildfire maps, develop actions and projects for wildfire prevention, and complete an assessment report to meet CWPP requirements for submittal to the Kansas Forest Service.	Wildfire	Fire Chief, Emergency Manager	High	1,2,3,4	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-25	Continue to monitor the potential impact from natural hazards on the Pawnee Watershed Joint District No. 81 and make changes as necessary.	Flood (**NFIP**)	Pawnee Watershed Joint District No. 81	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Pawnee County-26	Repetitive Flood (**NFIP**) Buyout. Develop a program in coordination with the State of Kansas Division of Emergency Management and FEMA to acquire and preserve parcels of land subject to repetitive flood from willing and voluntary property owners.	Flood (**NFIP**)	Emergency Manager Director	High	1,2	Dependent on Fair Market Value	Local, State, FEMA	Five years	Not started, lack of funding
Pawnee County-27	Mobile Home Park Tornado Shelter Ordinance Research and recommend an ordinance/resolution to require installation of tornado shelters for	Tornado, Windstorm	Director Emergency management	High	1,2	$500	Local	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	any major Not started, lack of funding manufactured and/or mobile home parks with more than 10 mobile home spaces.								
Pawnee County-28	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Director of Emergency Management	High	1,2,4	Staff Time	Local	Continuous	Not started, lack of funding
Pawnee County-29	Specific education programs should be developed in coordination with the Kansas Animal Health Department (KAH) to inform ranchers, farmers, and veterinary professionals on the methods to identify, prevent, and treat animal disease outbreaks. Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Agri Terrorism/Terrorism, Agricultural Infestation	Director Emergency management	Medium	1,2,3,4	$1,500	Local, State, Federal	Continuous	Not started, lack of funding
Pawnee County-30	An inventory/database on critical facilities should be created and maintained by the county and shared with the Kansas Division of Emergency Management. This inventory should include information on the location and risk to each facility, and should also document any cost-effective mitigation techniques to consider when funding becomes available. Identify the jurisdiction's most at-risk critical	All Hazards	Director of Emergency Management	Medium	2	$5,000	Local	Continuous	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible.								
Pawnee County-31	Develop cross-departmental information collection capabilities, and incorporate (building/parcel) data utilizing a GIS for purposes of conducting more detailed hazard risk assessments and for tracking permitting / land use patterns, buildings and infrastructure replacement costs, and overall structural accounting for the county.	All Hazards	Director Emergency management	High	1,2,4	$5,000	Local, Grants	Continuous	Not started, lack of funding
Pawnee County-32	Encourage utility providers and municipalities within the county to require that utility lines and mains be installed underground.	Utility/ Infrastructure Failure	Director Emergency management	High	1,2	Unknown	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-33	Study drainage throughout the county and implement measures for Flood (**NFIP**) Control management and improvement. Study drainage throughout the county and implement measures for Flood (**NFIP**) Control management and improvement. Clearing and keeping ditches and waterways clean and clear of debris. Keep Drainage and ditches at proper depths and widths. Maintain culverts and bridges At proper sizes and keep them clear of sediment and debris. Increase culvert Size if necessary.	Flood (**NFIP**)	Director Hwy Dept	Medium	1,2	$50,000 - $100,000	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-34	Officer shall develop educational materials regarding livestock bio-security to be distributed to the agricultural community in Pawnee County.	Agriculture Infestation	County Extension Agent	Low	1,2	$5,000	Local	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pawnee County-35	Trim or remove trees in areas that may block or occlude roadways.	All Hazards	Director Hwy Dept	Medium	1,2	$10,000 - $15,000	Local	12/31/2019	Not started, lack of funding
Pawnee County-36	Acquire and install hurricane shutters on the Courthouse Lounge windows.	Tornado, Windstorm	Emergency Management Director	Medium	1,2	$2,000	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-37	Acquire and install a permanently mounted emergency generator for the Pawnee County Courthouse.	Utility/ Infrastructure Failure	Emergency Management Director	Low	1,2	$25,000	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-38	Acquire outdoor warning systems and other early warning devices for unincorporated areas such as Camp Pawnee.	Tornado, Windstorm	Emergency Management Director	Low	1,2	$15,000	Local, State, Federal	Five years	Not started, lack of funding
Pawnee County-39	Purchase and installing a reverse 911 system in Pawnee County.	All Hazards	Emergency Management Director	Medium	1,2	$15,000	Local	Five years	Not started, lack of funding
Pawnee County-40	Purchase and install window shutters for Pawnee Valley Community Hospital.	All Hazards	Hospital Director	Medium	1,2	$300,000	Local, State, Federal	Five years	Not started, lack of funding
Burdett-1	The City of Burdett is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	Planner	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Burdett-2	Advertise and promote the availability of Flood insurance to property owners by direct mail on an annual basis. **(NFIP)**	Flood (**NFIP**)	Planner	High	3	Staff Time	Local	Five years	Not started, lack of funding
Burdett-3	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited public offices.	All Hazards	Emergency Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Burdett-4	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure	Utility/ Infrastructure Failure	Director Road and Bridge, Director REC	High	4	Staff Time	Local	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	to these hazards, and identification of mitigation strategies.								
Burdett-5	Annually host a public "hazards workshop" in combination with local festivals, county fair, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$300 per workshop	Local	Continuous	Not started, lack of funding
Burdett-6	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	Low	Local, State, Federal	Five years	Not started, lack of funding
Burdett-7	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Burdett-8	Promote and educate the jurisdiction's citizens on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	High	3	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Burdett-9	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager, Planner	Medium	1,2	$45,000	Local	Five years	Not started, lack of funding
Burdett-10	Seek funding to conduct a study for the location, design, and construction of a community safe room in the Burdett Senior Center.	Tornado, Windstorm	Planning Commission	Low	1,2	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Burdett-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	Mayor	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Burdett-12	Acquire and install a permanently mounted emergency generator to power the city well during periods of power outage.	Utility/ Infrastructure Failure	Mayor	Low	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Garfield-1	Advertise and promote the availability of Flood insurance to property owners by direct mail on an annual basis. **(NFIP)**	Flood (**NFIP**)	Planner	High	3	Staff Time	Local	Five years	Not started, lack of funding
Garfield-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited public offices.	All Hazards	Emergency Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Garfield-3	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Director Road and Bridge, Director REC	High	4	Staff Time	Local	Five years	Not started, lack of funding
Garfield-4	Annually host a public "hazards workshop" in combination with local festivals, county fair, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$300 per workshop	Local	Continuous	Not started, lack of funding
Garfield-5	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Five years	Not started, lack of funding
Garfield-6	Educate residents about driving in winter storms and handling winter-related health effects	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Garfield-7	Promote and educate the jurisdiction's citizens on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	High	3	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Garfield-8	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical	All Hazards	Emergency Manager, Planner	Medium	1,2	$30,000	Local	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	requirements, system types and operational procedures of each local jurisdiction.								
Garfield-9	Develop and implement a plan to divert or reduce Flood (**NFIP**) waters from the Arkansas River Tributary (Garfield Drain) and School Street. The Arkansas River Tributary (Garfield Drain) flows from southwest to northeast across the city. Following heavy rains Flood has been a persistent problem. School Street drainage is not adequate following heavy rains and compounds the Flood issue.	Flood (**NFIP**)	City Planners	Low	1,2	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Garfield-10	Pursue funding for the purchase and installation of emergency backup generators for the fire department water well, storm siren, and community center.	Winter Storm	Mayor	Medium	1,2	$60,000	Local, State, Federal	Five years	Not started, lack of funding
Garfield-11	Consider developing an application package for participation in the National Flood insurance Program (**NFIP**).	Flood (**NFIP**)	Mayor	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Larned-1	The city of Larned is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	Planner	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Larned-2	Advertise and promote the availability of Flood insurance to property owners by direct mail on an annual basis. **(NFIP)**	Flood (**NFIP**)	Planner	High	3	Staff Time	Local	Five years	Not started, lack of funding
Larned-3	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited public offices. .	All Hazards	Emergency Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Larned-4	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure	Utility/ Infrastructure Failure	Director Road and Bridge, Director REC	High	4	Staff Time	Local	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	to these hazards, and identification of mitigation strategies.								
Larned-5	Annually host a public "hazards workshop" in combination with local festivals, county fair, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding
Larned-6	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$300,000	Local, State, Federal	Five years	Not started, lack of funding
Larned-7	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Larned-8	Promote and educate the jurisdiction's citizens on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	High	3	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Larned-9	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager, Planner	Medium	1,2	$45,000	Local	Five years	Not started, lack of funding
Larned-10	Continue Levee maintenance in compliance with the Larned, Kansas Flood (**NFIP**) Control Project agreement and Operation and Maintenance Manual dated May 1982.	Dam and Levee Failure	Mayor	Medium	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Larned-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	Mayor	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Larned-12	Construct safe rooms in critical facilities or designated areas that are accessible to	Tornado, Windstorm	Mayor	Low	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	the community. Seek outside funding sources to implement the program.								
Pawnee Rock-1	Construct safe rooms in critical facilities or designated areas that are accessible to the community. Seek outside funding sources to implement the program.	Tornado, Windstorm	Mayor	High	1,2	$500,000	Local, State, Federal	Five years	New
Pawnee Rock-2	The city of Pawnee Rock is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	Planner	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Pawnee Rock-3	Advertise and promote the availability of Flood insurance to property owners by direct mail on an annual basis. **(NFIP)**	Flood (**NFIP**)	Planner	High	3	Staff Time	Local	Five years	Not started, lack of funding
Rozel-1	The city of Rozel is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	Planner	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Rozel-2	Advertise and promote the availability of Flood insurance to property owners by direct mail on an annual basis. **(NFIP)**	Flood (**NFIP**)	Planner	High	3	Staff Time	Local	Five years	Not started, lack of funding
Rozel-3	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited public offices.	All Hazards	Emergency Manager	High	3	Staff Time	State, Federal	Continuous	Not started, lack of funding
Rozel-4	Coordinate county and local government mitigation efforts RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/Infrastructure Failure	Director Road and Bridge, Director REC	High	4	Staff Time	Local	Five years	Not started, lack of funding
Rozel-5	Annually host a public “hazards workshop” in combination with local festivals, county fair, or other appropriate events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local	Continuous	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Rozel-6	Encourage and construct safe rooms and storm shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Five years	Not started, lack of funding
Rozel-7	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Rozel-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	High	3	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Rozel-9	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager, Planner	Medium	1,2	$45,000	Local	Five years	Not started, lack of funding
Rozel-10	Seek funding to conduct a study for the location, design, and construction of a community safe room in Rozel Community Center.	Tornado	Mayor	Low	1,2	$350,000	Local, State, Federal	Five years	Not started, lack of funding
Rozel-11	Assess Flood (**NFIP**) prone areas and recommend Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	Mayor	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Rozel-12	Emergency Generator for Community Center. Rozel's Community Center is a designated community shelter. The community center has no emergency backup power generation. Acquire and install a properly sized permanently mounted emergency generator.	Utility/Infrastructure Failure	Mayor	Medium	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.9: Pawnee County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
USD#495-1	Develop and seek funding for mitigation projects for the construction of tornado safe rooms for USD 495 schools.	Tornado, Windstorm	Superintendent	Low	1,2	$1,000,000	Federal	Five years	Not started, lack of funding
USD#496-1	Develop and seek funding for mitigation projects for the construction of tornado safe rooms for USD 496 schools.	Tornado, Windstorm	Superintendent	Medium	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
USD#496-2	Evaluate the benefits of purchasing Flood insurance for the school district.	Flood (**NFIP**)	Superintendent	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
USD#496-3	Identify and clearly mark evacuation routes. Occasional remodel or repurposing of rooms might necessitate rerouting evacuation.	All Hazards	Superintendent	Medium	1,2	$200	Local	Five years	Not started, lack of funding
MidWest Energy REC-1	ACSR Conductor. Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer economically feasible to use. Reconductor existing copper-weld lines with aluminum steel reinforced conductor and replace poles as needed.	Utility/ Infrastructure Failure	Director	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Pawnee Watershed Joint District #81-1	Continue to monitor the potential impact from natural hazards on the Pawnee Watershed Joint District No. 81 and make changes as necessary.	Flood (**NFIP**)	Pawnee Watershed Joint District No. 81	High	1,2	Staff Time	Local	Continuous	New

6.8.7 – Pratt County and Participating Jurisdictions Mitigation Actions

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pratt County-1	The County and local governments will work with the Kansas Department of Agriculture - Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	3,4	Staff Time	Local, State	Five years	Not started, lack of funding
Pratt County-2	On an annual basis, contact owners identified in high-risk Flood (**NFIP**) areas and inform them of potential availability of assistance through the Federal Flood (**NFIP**) Mitigation Assistance (FMA) program, in addition to other Flood (**NFIP**) protection measures.	Flood (**NFIP**)	Emergency Manager	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Pratt County-3	Coordinate county and local government mitigation efforts with RECs, encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Road Department Supervisor	High	4	Staff Time	Local	Five years	Not started, lack of funding
Pratt County-4	Annually host a public "hazards workshop" for residents, in combination with local festivals, fairs, or other appropriate County/City events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local	Continuous	Last event 2018
Pratt County-5	Appoint a planning committee to research and develop a Land Use Plan for Pratt County.	Flood (**NFIP**)	Emergency Manager	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Pratt County-6	Identify the most at-risk critical facilities, and evaluate potential mitigation techniques for protecting each facility to the maximum extent possible. A thorough evaluation of potential mitigation opportunities for Pratt	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Continuous	Going through THIRA

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	County's critical facilities should be completed.								
Pratt County-7	Conduct an inventory/survey for the jurisdiction's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.	All Hazards	Emergency Manager	Medium	1,2	Staff Time	Local, State	Continuous	Not started, lack of funding
Pratt County-8	Develop and implement a wild/rangeland fire prevention/education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local	Continuous	Not started, lack of funding
Pratt County-9	Appoint a working group to evaluate the firefighting water supply resources within the County.	Wildfire	Fire Chief	Medium	1,2,3,4	Staff Time	Local	Five years	Not started, lack of funding
Pratt County-10	Seek funding to design and build a safe room at the Pratt County Fairgrounds.	Tornado, Windstorm	Emergency Manager	Medium	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
Pratt County-11	Seek funding to install a backup power generator at the Pratt County Fairgrounds.	Utility/ Infrastructure Failure	Emergency Manager	High	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Pratt County-12	Study drainage throughout the county and townships, and implement measures for Flood (**NFIP**) control management and improvement. Clearing, and keeping ditches and waterways clean and clear of debris. Keep drainage and ditches at proper depths and widths. Maintain culvers and bridges at proper sizes and keep them clear of sediment and debris. Increase culvert as necessary.	Flood (**NFIP**)	Emergency Manager	Medium	1,2	$50,000 - $500,000	Local, State	Five years	Not started, lack of funding
Pratt County-13	Protection of a life sustaining resource, Pratt Regional Medical Center's liquid oxygen tank by moving the tank to a different location and construct a concrete structure around it to protect it from hazards.	Tornado, Windstorm, Winter Storm	Hospital Preparedness Coordinator	High	1	$40,000	HMGP	Unknown	Not started, lack of funding

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pratt County-14	Acquire and distribute NOAA weather radios to county citizens with special emphasis on vulnerable populations (target 100 households/facilities)	Windstorm, Tornado	Emergency Management	Medium	1,2	$7,500	Local, State, Federal	Five years	New
Pratt County-15	As part of local response emergency planning, work with local healthcare and other partners to identify citizens with functional and access needs	All Hazards	Health Department	High	1,2	Staff Time	Local, State, Federal	2 years	New
Pratt County-16	Increase physical security of communications towers, repeaters and generators.to include possible lighting, alert systems, fencing	All Hazards	Communications Director/Sheriff	High	1,2,3 & 4	$200,000	Local, State, Federal	Five years	New
Pratt County-17	Improve emergency communications redundancies through purchase and placement of amateur radios in critical facilities to include EOC, hospital, PSAP, law enforcement center, EMS and all fire stations.	All Hazards	Communications Director	Medium	2,4	$30,000	Local, State, Federal	Five years	New
Pratt County-18	Pursue opportunities to replace aging storm sirens or place new sirens in underserved areas with concentrations of vulnerable populations	Windstorm, Tornado	Emergency Management	Medium	1,2	$30,000	Local, State, Federal	Five years	New
Pratt County-19	Purchase and install backup power generators for all critical facilities.	Utility/ Infrastructure Failure	Emergency Management	Medium	1,2	$30,000	Local, State, Federal	Five years	New
Pratt County-20	Increase physical security for all critical facilities to include the use of cameras, access controls and panic systems	Civil Disorder / Terrorism	Law Enforcement	Medium	1,2,3,4	$250,000	Local, State, Federal	Five years	New
Byers-1	Seek funding to design and build safe rooms. The community does not have any protection from tornado and high wind, and very few residents have basements.	Tornado, Windstorm	Mayor	High	1,2	$350,000	Local, State, Federal	Five years	Not started, lack of funding
Byers-2	Appoint a committee to develop an application package for participation in the **NFIP**, to include an Application for	Flood (**NFIP**)	Mayor	Medium	1,2,3	Staff Time	Local	Five years	Not started, lack of funding

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	Participation, a Resolution of Intent, which indicates an explicit desire to participate in the **NFIP**, and Floodplain Management Regulations that exceed the minimum Flood (**NFIP**) plain management requirements of the **NFIP**.								
Coats-1	Seek funding to design and build safe rooms for the City of Coats.	Tornado, Windstorm	Mayor	High	1,2	$350,000	Local, State, Federal	Five years	Not started, lack of funding
Coats-2	Appoint a committee to consider developing an application package for participation in the **NFIP**.	Flood (**NFIP**)	Mayor	Medium	1,2,4	Staff Time	Local	Five years	Not started, lack of funding
Coats-3	Appoint a committee to evaluate and consider the installation of fencing around the Kanza COOP to create a secure perimeter around the various chemical storage tanks located on the grounds.	Hazardous Material	Mayor	Medium	1,2	Staff Time	Local, State	Five years	Not started, lack of funding
Cullison-1	Seek funding to design and build safe rooms for the town of Cullison.	Tornado, Windstorm	Mayor	High	1,2	$400,000	Local, State, Federal	Five years	Not started, lack of funding
Cullison-2	Appoint a committee to consider developing an application package for participation in the **NFIP**.	Flood (**NFIP**)	Mayor	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Iuka-1	Appoint a committee to consider developing an application package for participation in the **NFIP**.	Flood (**NFIP**)	Mayor	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Iuka-2	Seek funding to design and build safe rooms for the town of luka.	Tornado, Windstorm	Mayor	High	1,2	$1,000,000	Local, State, Federal, Rural Developme nt Grants	Five years	Not started, lack of funding
City of Pratt 1	Appoint a planning committee to assess Flood (**NFIP**) prone areas and	Flood (**NFIP**)	City Inspector	Medium	1,2,4	Staff Time	Local	Five years	In progress

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	recommend Flood (**NFIP**) reduction measures to city planners.								
City of Pratt 2	The City of Pratt is committed to continued participation and compliance with the NFIP.	Flood (NFIP)	Floodplain Manager	High	1,2	Staff Time	Local	Continuous	On-going
City of Pratt 3	The City of Pratt will continue to participate in the NFIP Community Rating System (CRS) and will maintain and/or improve the City's class rating.	Flood (NFIP)	Floodplain Manager	High	1, 2, 3, 4	Staff Time	Local	Continuous	On-going
City of Pratt 4	Advertise and promote the availability of flood insurance to property owners by direct mail once per year.	Flood (NFIP)	Floodplain Manager	Medium	3, 4	Staff Time	Local	Continuous	On-going
City of Pratt 5	Work with the State and FEMA to develop Digital Flood Insurance Rate Maps (DFIRMs) for the City of Pratt. Current Flood Insurance Rate Maps (FIRMs) were revised in 1983.	Flood	Floodplain Manager, City Inspector	High	4	Unknown	Local, State, Federal	5 years	On-going
City of Pratt 6	Continue to ensure ditches and creeks are free of debris to ensure proper water flow. They are currently checked every six months and after significant storms.	Flood	Floodplain Manager	High	1, 2	Staff Time	Local	Continuous	On-going
City of Pratt 7	Have a communitywide tree-trimming program to cut down branches and trees away from power lines and drainage areas.	All Hazards	City Manager	High	1, 2	Staff Time	Local	Continuous	On-going
City of Pratt 8	Encourage the building of safe rooms/basements in all new construction.	Tornado Windstorm	City Inspector	Medium	1, 2	Staff Time	Local	Continuous	Not started
City of Pratt 9	Seek funding sources for retrofitting the Municipal Building and The Community Center with backup generators for continuous electricity in designated safe places for relocation and shelter in times of need.	All Hazards	City Manager, Public Works Director, Electric Utility Director	High	1, 2,	$450,000	Local, State, Federal	5 years	Lack of Funding Available

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
City of Pratt 10	Seek funding sources to upgrade and purchase additional equipment needed for clearance of transportation infrastructure to enable safe travel through the city during and after disasters (i.e.- road grader and snowplows)	Primarily Snow & Ice storms Could be used in all Hazards	Public Works Director	High	1, 2	$250,000	Local, State Federal	5 years	Lack of Funding Available
Preston-1	Appoint a committee to consider developing an application package for participation in the **NFIP**.	Flood (**NFIP**)	Mayor	Medium	1,2,4	Staff Time	Local	Five years	Not started, lack of funding
Preston-2	Seek funding to design and build safe rooms for the town of Preston.	Tornado, Windstorm	City Clerk	High	1,2	$500,000	Local, State, Federal, Rural Developme nt Grant	Five years	Not started, lack of funding
Preston-3	Seek funding to upgrade/repair existing water tower.	Utility/ Infrastructure Failure	City Clerk	Medium	1,2	$200,000	Local, State, Federal, Rural Developme nt Grant	Five years	Not started, lack of funding
Sawyer-1	Seek funding to design and build safe rooms for the town of Sawyer. The community of Sawyer does not have any protection from tornado and high wind, and very few residents have basements. Additionally, funding resources are scarce. Consideration should be given to constructing community safe rooms for residents during tornadic events.	Tornado, Windstorm	Mayor	High	1,2	$400,000	Local, State, Federal	Five years	Not started, lack of funding
Sawyer-2	Seek funding to replace/upgrade the existing outdoor warning siren.	Tornado, Windstorm	City Clerk	High	1,2	$25,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pratt Community College-1	Develop and fund mitigation projects for the construction of tornado safe rooms on the Pratt Community College campus	Tornado	Superintendent	Medium	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Pratt Community College-2	Conduct an emergency shelter electricity study. Pratt Community College is listed as a red-cross shelter. To be prepared for this responsibility, it is necessary to have a reliable means of attaching an external generator.	All Hazards	Planning and Assessment Assistant	Medium	1,2	$5,000	Local, State, Federal	3 months	Not started, lack of funding
Pratt Community College-4	Purchase and install a fixed site generator.	All Hazards	Planning and Assessment Assistant	High	1,2	$30,000	Local, State, Federal	3 months	Not started, lack of funding
USD#382-1	Develop and fund mitigation projects for the construction of tornado safe rooms in Unified School District 382 schools.	Tornado	Superintendent	Medium	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD#382-2	Seek funding for the purchase and installation of backup power sources in USD 382 facilities.	Utility/ Infrastructure Failure	Superintendent	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
USD#382-3	Assess elevations and water flow in the district to qualify the benefit of Flood (**NFIP**) control projects in the District. The Pratt Unified School District #382 would like to consider analyzing the potential benefits of constructing soil-based berms, and other Flood (**NFIP**) control projects, around various facilities in the district to mitigate the effects from Flooding. (**NFIP**)	Flood (**NFIP**)	Superintendent	Medium	1,2	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
USD#382-4	Establish a committee to research and evaluate the benefits of purchasing Flood insurance for the school district.	Flood (**NFIP**)	Superintendent	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
USD#382-5	Continue and enhance security systems in all USD382 buildings	All Hazards	Superintendent	High	1,2	$20,000	Capital Outlay	Five years	Not started, lack of funding

Table 6.10: Pratt County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
USD#438-1	Develop and implement wind resistant design modifications to reduce exposure to all types of wind events.	Tornado, Windstorm	Superintendent	Medium	1,2	$35,000	Local, State, Federal	Five years	Not started, lack of funding
MidWest Energy-1	ACSR Conductor. Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer economically feasible to use. Reconductor existing copper-weld lines with aluminum steel reinforced conductor and replace poles as needed.	Utility/ Infrastructure Failure	Director	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Ninnescah Rural Electric Cooperative-1	Materials to help with our educational programs for children in order to share the message of the dangers of electricity.	Utility/ Infrastructure Failure	General Manager	Low	3	$2,000	Local, State, Federal	Five years	Not started, lack of funding
South Pioneer REC-1	Upgrade and Enhance Power lines. Replacement of CWC single-phase line of enhanced design. The miles of line selected will meet several points of prioritization and evaluation and represent a small percentage of total CWC miles in the rural electric distribution system. Replacing the lines would significantly mitigate losses due to damages and greatly enhance reliability in the surrounding areas. The aged CWC construction has sustained much damage over the years and was not built to current and acceptable standards. Nearly all of RECs membership in the county would directly, if not indirectly, benefit from improved safety and improved reliability of such replacements.	All Hazards	Rural Electric Coop	Medium	1,2	$1,160,000	HMGP Grant, PDM Grant, Local Budget, Grants, Heartland REC	Four years	Not started, lack of funding

6.8.8 – Stafford County and Participating Jurisdictions Mitigation Actions

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Stafford County-1	The County and local governments will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**	Flood (**NFIP**)	Emergency Manager	Medium	3,4	Staff Time	Local, State	Five years	Not started, lack of funding
Stafford County-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Stafford County-3	Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (REC's), encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Rural Electric Director, Emergency Manager	High	4	Staff Time	NA	Continuous	Not started, lack of funding
Stafford County-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate Community events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local, State	Continuous	Not started, lack of funding
Stafford County-5	Encourage the construction of safe rooms and tornado shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Stafford County-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Stafford County-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the county and regional economies, and	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	develop and implement plans to address these issues..								
Stafford County-8	Prepare and adopt an Outdoor Warning Sirens Plan for the county, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	High	1,2	Staff Time	Local	Five years	Not started, lack of funding
Stafford County-9	Conduct an inventory/survey for the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.	All Hazards	Emergency Manager	Medium	1,2	Staff Time	Local, State	Five years	Not started, lack of funding
Stafford County-10	Research, develop and recommend an ordinance/resolution to require installation of tornado shelters for Not started, lack of funding major manufactured and/or mobile home parks with more than 30 mobile home spaces.	Tornado, Windstorm	Director Planning and Zoning	Medium	1,2	Staff Time	NA	Five years	Not started, lack of funding
Stafford County-11	Develop cross-departmental information collection capabilities, and incorporate {building/parcel) data utilizing a GIS for purposes of conducting more detailed hazard risk assessments, and for tracking permitting / land use patterns, buildings and infrastructure replacement costs, and overall structural accounting for the county.	All Hazards	Appraiser, Director of Planning and Zoning	High	4	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
Stafford County-12	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief	Medium	1,2,3,4	Staff Time	Local	Continuous	Not started, lack of funding
Stafford County-13	Examine the current agreements within the county and assess the need to expand or update cooperative agreements for firefighting resources.	Wildfire	Fire Chief	Medium	4	Staff Time	Local	Five years	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Stafford County-14	Examine the current agreements within the county and assess the need to expand or update cooperative agreements for firefighting resources. Include agreements with local, state and federal agencies.	Wildfire	Fire Chief	Medium	4	Staff Time	Local	Five years	Not started, lack of funding
Stafford County-15	Create a working group to evaluate the firefighting water supply resources within the County.	Wildfire	Fire Chief	Medium	1,2,3,4	Staff Time	Local	Five years	Not started, lack of funding
Stafford County-16	Appoint a committee to research and recommend appropriate building codes for the County that includes wind-resistant design techniques for Not started, lack of funding construction.	Tornado, Windstorm	Director Planning and Zoning	High	1,2	Staff Time	NA	Five years	Not started, lack of funding
Stafford County-17	Encourage the repositioning of as many utility lines as possible underground.	Utility/ Infrastructure Failure	Director Planning and Zoning, and Roads and Bridges	High	1,2	Unknown	Local	Five years	Not started, lack of funding
Stafford County-18	Appoint a planning committee to develop an annex to the Local Emergency Operations Plan (LEOP) for Dam / Levee Failure response and evacuation plan for High Hazard structures.	Dam and Levee Failure	Emergency Manager	Medium	1,2	Staff Time	Local	Five years	Not started, lack of funding
Stafford County-19	Emergency Management will contact the owner of the high hazard dam, the Cedar Creek Reservoir, in the county, and inform them of their responsibility to provide Emergency Action Plan to Stafford County Emergency Management as prescribed by the KDA–Water Resources Division, Chief Engineer. .	Dam and Levee Failure	Emergency Manager	Medium	1,2,3	Staff Time	Local	Five years	This project continues to be valid, however no progress has been made to date.
Stafford County-20	Identify the county's most at-risk critical facilities, evaluate potential mitigation	All Hazards	Emergency Manager	Medium	2	Staff Time	Local	Five years	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	techniques for protecting each facility to the maximum extent possible.								
Hudson-1	The City of Hudson will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	1,2,4	Staff Time	Local, State	Five years	Not started, lack of funding
Hudson-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Hudson-3	Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (REC's), encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies	Utility/ Infrastructure Failure	Rural Electric Director, Emergency Manager	High	4	Staff Time	NA	Continuous	Not started, lack of funding
Hudson-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate Community events.	All Hazards	Emergency Manager	Medium	3	500 per workshop	Local, State	Continuous	Not started, lack of funding
Hudson-5	Encourage and construct safe rooms and tornado shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$400,000	Local, State, Federal	Continuous	Not started, lack of funding
Hudson-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Hudson-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the city and regional economies, and develop	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	and implement plans to address these issues.								
Hudson-8	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction..	All Hazards	Emergency Manager	High	1,2	$60,000	Local	Five years	Not started, lack of funding
Hudson-9	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during inclement weather.	All Hazards	Mayor	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
Hudson-10	Seek funding to design and build a tornado shelter for the City of Hudson.	Tornado, Windstorm	Mayor	Medium	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
Macksville-1	The City of Macksville will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	1,2,4	Staff Time	Local, State	Five years	Not started, lack of funding
Macksville-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Macksville-3	Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (REC's), encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Rural Electric Director, Emergency Manager	High	4	Staff Time	NA	Continuous	Not started, lack of funding
Macksville-4	Annually host a public "hazards workshop" in combination with local	All Hazards	Emergency Manager	Medium	3	300 per workshop	Local, State	Continuous	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	festivals, fairs, or other appropriate Community events.								
Macksville-5	Encourage and construct safe rooms and tornado shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Continuous	Not started, lack of funding
Macksville-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Macksville-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the city and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Macksville-8	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction..	All Hazards	Emergency Manager	High	1,2	$45,000	Local	Five years	Not started, lack of funding
Macksville-9	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during inclement weather.	All Hazards	Mayor	Medium	1,2	Unknown	Local, State, Federal	Five years	Not started, lack of funding
Macksville-10	Appoint a committee to research and develop an application package for participation in the **NFIP**. .	Flood (**NFIP**)	Mayor	Medium	1,2,4	Staff Time	Local	Five years	Not started, lack of funding
Radium-1	The City of Radium will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	1,2,4	Staff Time	Local, State	Five years	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Radium-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Radium-3	Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (REC's), encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies	Utility/ Infrastructure Failure	Rural Electric Director, Emergency Manager	High	4	Staff Time	NA	Continuous	Not started, lack of funding
Radium-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate Community events.	All Hazards	Emergency Manager	Medium	3	$250 per workshop	Local, State	Continuous	Not started, lack of funding
Radium-5	Encourage and construct safe rooms and tornado shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Continuous	Not started, lack of funding
Radium-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
Radium-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the city and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Radium-8	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system	All Hazards	Emergency Manager	High	1,2	$45,000	Local	Five years	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	types and operational procedures of each local jurisdiction.								
Radium-9	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during inclement weather.	All Hazards	Mayor	Medium	1,2	Unknown	Local, State, Federal	Five years	Not started, lack of funding
Seward-1	The City of Seward will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	1,2,4	Staff Time	Local, State	Five years	Not started, lack of funding
Seward-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local, State	Continuous	Not started, lack of funding
Seward-3	Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (REC's), encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Rural Electric Director, Emergency Manager	High	4	Staff Time	NA	Continuous	Not started, lack of funding
Seward-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate Community events.	All Hazards	Emergency Manager	Medium	3	$300 per workshop	Local, State	Continuous	Not started, lack of funding
Seward-5	Encourage the construction of safe rooms and tornado shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Continuous	Not started, lack of funding
Seward-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Seward-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the city and regional economies, and develop and implement plans to address these issues.	Terrorism. Agri-Terrorism, Civil Disorder /	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
Seward-8	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	High	1,2	Unknown	Local	Five years	Not started, lack of funding
Seward-9	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during inclement weather.	All Hazards	Mayor	Medium	1,2	$30,000	Local, State, Federal	Five years	Not started, lack of funding
Seward-10	Establish an committee to provide and distribute educational brochures about the dangers and use of propane for residential and commercial properties in the community.	Hazardous Material	Mayor	Medium	1,2,3,4	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
St. John-1	The City of St. John will work with the Kansas Department of Agriculture – Division of Water Resources to educate and promote local jurisdictional participation in the **NFIP**.	Flood (**NFIP**)	Emergency Manager	Medium	1,2,4	Staff Time	Local, State	Five years	Not started, lack of funding
St. John-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices.	All Hazards	Emergency Manager	High	3	Staff Time	Local, State	Continuous	Not started, lack of funding
St. John-3	Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (REC's), encourage identification of hazards potentially	Utility/ Infrastructure Failure	Rural Electric Director, Emergency Manager	High	4	Staff Time	NA	Continuous	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.								
St. John-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate Community events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local, State	Continuous	Not started, lack of funding
St. John-5	Encourage and construct safe rooms and tornado shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$500,000	Local, State, Federal	Continuous	Not started, lack of funding
St. John-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
St. John-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the city and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding
St. John-8	Prepare and adopt an Outdoor Warning Sirens Plan for the city, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction.	All Hazards	Emergency Manager	High	1,2	$30,000	Local	Five years	Not started, lack of funding
St. John-9	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during inclement weather.	All Hazards	Mayor	Medium	1,2	Unknown	Local, State, Federal	Five years	Not started, lack of funding
City of Stafford-1	The City of Stafford will work with the Kansas Department of Agriculture – Division of Water Resources to educate	Flood (**NFIP**)	Emergency Manager	Medium	1,2,4	Staff Time	Local, State	Five years	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	and promote local jurisdictional participation in the **NFIP**.								
City of Stafford-2	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited government offices. .	All Hazards	Emergency Manager	High	3	Staff Time	Local, State	Continuous	Not started, lack of funding
City of Stafford-3	Coordinate county and local government mitigation efforts with Rural Electric Cooperatives (REC's), encourage identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards, and identification of mitigation strategies.	Utility/ Infrastructure Failure	Rural Electric Director, Emergency Manager	High	4	Staff Time	NA	Continuous	Not started, lack of funding
City of Stafford-4	Annually host a public "hazards workshop" in combination with local festivals, fairs, or other appropriate Community events.	All Hazards	Emergency Manager	Medium	3	$500 per workshop	Local, State	Continuous	Not started, lack of funding
City of Stafford-5	Encourage and construct safe rooms and tornado shelters in public and private schools, day care centers and senior care facilities.	Tornado, Windstorm	Emergency Manager	High	1,2	$350,000	Local, State, Federal	Continuous	Not started, lack of funding
City of Stafford-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	High	3	Staff Time	Local	Continuous	Not started, lack of funding
City of Stafford-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues that can severely impact the city and regional economies, and develop and implement plans to address these issues.	Terrorism/ Agri-Terrorism, Civil Disorder	Emergency Manager	Medium	3	Staff Time	Local, State, Federal	Continuous	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
City of Stafford-9	The City of Stafford is committed to continued participation and compliance with the **NFIP**.	Flood (**NFIP**)	Mayor	Medium	1,2,4	Staff Time	State, Federal, Grants	Continuous	Not started, lack of funding
City of Stafford-10	Appoint a planning committee to identify Flood (**NFIP**) prone areas to consider Flood (**NFIP**) reduction measures to city planners.	Flood (**NFIP**)	Mayor	Medium	1,2,3,4	Staff Time	Local	Five years	Not started, lack of funding
USD#349-1	Purchase generators for all school buildings.	All Hazards	Superintendent	Medium	1,2	$1,000,000	FEMA	Five years	Not started, lack of funding
USD#350-1	Develop and fund mitigation projects for the construction of tornado safe rooms for Unified School District 350 schools.	Tornado, Windstorm	Superintendent	Medium	1,2	$1,000,000	FEMA	Five years	Not started, lack of funding
USD#350-2	Seek funding for the purchase and installation of backup power sources in USD 350 facilities.	Utility/ Infrastructure Failure	Superintendent	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD#351-1	Develop and fund mitigation projects for the construction of tornado safe rooms in Unified School District 351 schools.	Tornado, Windstorm	Superintendent	Medium	1,2	$1,000,000	FEMA	Five years	Not started, lack of funding
Arkansas Valley REC-1	Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer economically feasible to use. Reconductor existing copper-weld lines with aluminum steel reinforced conductor and replace poles as needed.	Utility/ Infrastructure Failure	Director	High	1,2	$400,000	Local, State, Federal	Five years	Not started, lack of funding
Midwest REC-1	ACSR Conductor. Replace damaged copperweld conductor with equivalent but not less than 2 ACSR conductor. Copperweld conductor is no longer readily available and the cost of copper has risen to where it is no longer economically feasible to use. Reconductor existing copperweld lines	Utility/Infrastructure Failure	Director	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.11: Stafford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	with aluminum steel reinforced conductor and replace poles as needed.								
Ninnescah REC-1	Purchase backup generators for critical facilities	Utility/ Infrastructure Failure	Director	High	2	$10,000 to $15,000 per unit	Local, State, Federal	Three years	Not started, lack of funding
Ninnescah REC-	Upgrade and Enhance Power lines.	Utility/ Infrastructure Failure	Director	Medium	1,2	$1,000,000	Local, State, Federal	Four years	Not started, lack of funding

6.9 –Mitigation Actions No Longer Under Consideration

For this plan update, members of the MPC and participating jurisdictions were asked to consider if all previous mitigation actions were still viable. Due to the thorough nature of the review, and the comprehensive updating of mitigation actions to meet both the needs of the participating jurisdictions and FEMA planning requirements, many actions were modified to reflect current conditions. However, no mitigation actions were removed from consideration for this plan update. A full comparison of jurisdictional actions may be completed by comparing the actions detailed in this plan against the actions from the 2013 regional hazard mitigation plan.

6.10 – Action Implementation and Monitoring

44 CFR 201.6 (c)(3)(iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section 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.

Kansas Region E and relevant participating jurisdictions are responsible for implementing their identified mitigation action(s). To foster accountability and increase the likelihood that actions will be implemented, every proposed action is assigned to an action champion. In general:

- The identified champion will be responsible for tracking and reporting on action status.
- The identified champion will provide input on whether the action as implemented is successful in reducing vulnerability.
- If the action is unsuccessful in reducing vulnerability, the identified champion will be tasked with identifying deficiencies and additional required actions.

Additionally, each action has been assigned a proposed completion timeframe to assist in tracking the continued viability of the action if not completed, and to assist participating jurisdictions in potentially programming Funding to complete the actions.

In general, each participating jurisdiction, along with the MPC, is responsible for monitoring the progress of mitigation activities and projects. To facilitate the tracking of mitigation actions the Kansas Region E MPC and KDEM, in conjunction with participating jurisdictions, will compile a list of projects funded and completed. Additionally, the MPC and participating jurisdictions will be solicited annually to provide information on any other mitigation projects that were not funded through hazard mitigation grants for tracking and update purposes.

To track mitigation projects from initiation to closeout, participating jurisdictions will use a project tracking methodology that includes, at a minimum, the following information:

- Applicant data
- Grant identifier

- Award date
- Awarded contractor
- Period of Performance
- Total project cost, including local share of project
- Quarterly Reports

Upon completion of a project the awarded participating jurisdiction will conduct a closeout site visit to:

- Review all project documents
- Review all procurement documents and contracts
- Photograph completed project

Project closeout packages will generally be submitted no more than 90 days after a project has been completed, and should include the following:

- All available documentation
- Photographs of completed project
- Materials, labor and equipment documentation
- Close-out certification

6.11 – Jurisdictional Compliance with NFIP

44 CFR 201.6 (c)(3)(ii) All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Participating jurisdictions are committed to continued involvement and compliance with the **NFIP**. To help facilitate compliance, each participating jurisdiction:

- Adopts Floodplain regulations through local ordinance
- Enforces Floodplain ordinances through building restrictions as detailed in relevant ordinance
- Regulates new construction in Special Flood (**NFIP**) Hazard Areas as outlined in their Floodplain ordinance
- Utilizes FEMA FIRMs
- Monitors Floodplain activities

Currently, no participating jurisdiction has available funding to complete local requests for Floodplain map updates. Additionally, as of this plan, there are no active community assistance or monitoring activities occurring in any participating jurisdiction. Key to achieving across the board reduction in Flood (**NFIP**) damages is a robust community assistance, education and awareness program. As such, Kansas Region E and its participating jurisdictions will continue to develop both electronic (including social media) and in person outreach activities.

Specific mitigation actions supporting regional commitment to both the **NFIP** and potential CRS application and compliance were identified above with a bold type **NFIP** in the subsequent mitigation action sections.

6.12 –Primary Mitigation Action Funding Sources

It is generally recognized that mitigation actions help communities realize long term savings by preventing future losses due to hazard events. However, many mitigation actions are beyond the budgetary capabilities a jurisdiction and Funding assistance, often in the form of grants, may be required. This following table provides a general description of some of the primary avenues available to jurisdictions to defray the cost of implementing mitigation actions.

Table 6.12: Primary Hazard Mitigation Funding Mechanisms

Program	Funding Agency	Funding Match Requirement	Program Description
Community Development Block Grant Program	Department of Housing and Urban Development	N/A	Program is a competitive grant process through which about half of the Funding goes to support the development of community facilities and water and sewer projects. grants in four categories, community improvement, urgent need, Kansas Small Towns Environment Program and economic development.
Federal Public Assistance	FEMA	Varied	Provides Funding used to restore the parts of a structure that was damaged during a disaster. The restoration must provide protection from subsequent events.
Federal Individual Assistance	FEMA	Varied	Provides assistance for qualified homeowners/renters whose primary residence was damaged or destroyed in a declared designated area.
Flood (**NFIP**) Mitigation Assistance	FEMA	Varied	Program provides Funding to States, Territories, federally-recognized tribes and local communities for projects and planning that reduces or eliminates long-term risk of Flood (**NFIP**) damage to structures insured under the **NFIP**. Funding is also available for management costs.
Hazard Mitigation Grant Program	FEMA	25%	Program is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. Funding is available, when authorized under the Presidential Major Disaster Declaration, in the areas of the state requested by the governor. The amount of Funding available to the applicant is based upon the total federal assistance provided by FEMA for disaster recovery under the major disaster declaration.
Pre-Disaster Mitigation Program	FEMA	25%	Program is designed to assist states, territories, Indian tribal governments, and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on federal Funding from future major disaster declarations.

6.13 – Additional Hazard Mitigation Funding Mechanisms

A wide variety of federal and state agencies offer mechanisms for funding mitigation projects. A thorough, but by no means complete, list of potential mitigaion funding sources are detailed in the following table along with a brief program description.

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
FEMA	Fire Management Assistance Grant Program	Provides for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands. The process is initiated when the state requests federal assistance for an event where the threat of major disaster exists for either single fires or numerous small fires.
FEMA	Risk Mapping, Assessment, and Planning (Risk Map)	The Risk MAP strategy incorporates Floodplain management with hazard mitigation by using tools such as DFIRMs, HAZUS reports, and risk assessment data to deliver quality data that increases public awareness and leads to action to reduce risk to life and property.
National Oceanic and Atmospheric Administration National Weather Service (NOAA NWS)	StormReady Program	StormReady is a voluntary program that was developed by NOAA NWS to help communities better prepare for and mitigate effects of all types of severe weather from tornadoes to flooding. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.
Mutual Aid	Kansas Water, Wastewater, Gas and Electric Utility Mutual Aid Program (KSMAP)	KSMAP has been developed to serve as the mutual aid program for Kansas utilities to help with provision of equipment, materials and personnel to assist in the restoration and continuation of utility service for those utilities needing assistance. The project is a joint effort of Kansas Municipal Utilities, Kansas Rural Water Association, the Kansas Section – American Water Works Association, the Kansas Water Environment Association, Kansas Corporation Commission, Kansas Department of Health & Environment and the Kansas Division of Emergency Management.
FEMA	Individual & Households, Other Needs Assistance (ONA) Program	The ONA program provides financial assistance to individuals or households who sustain damage or develop serious needs because of a natural or man-made disaster. The Funding share is 75% federal funds and 25% state funds. The program gives funds for disaster-related necessary expenses and serious needs, including personal property, transportation, medical and dental, funeral, essential tools, Flood (**NFIP**) insurance, and moving and storage. The current maximum allowable amount for any one disaster to individuals or families is $25,000.
Kansas Department of Agriculture – Division of Conservation (KDA-DoC)	Multipurpose Small Lakes Program	Provides state cost-share assistance to a government entity for the construction or renovation of a dam for flood control and water supply and/or recreational purposes. It requires a general plan of works and a local nonpoint source pollution control plan. https://agriculture.ks.gov/divisions-programs/division-of-conservation/flood-control-and-lakes-programs

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
(KDA-DoC)	State Assistance to Watershed Dam Construction	Provides state cost-share assistance to a government entity for the construction or renovation of a dam for flood control and water supply and/or recreational purposes. It requires a general plan of works and a local nonpoint source pollution control plan.
(KDA-DoC)	State Assistance to Watershed Dam Construction	Provides cost-share assistance to organized watershed districts and other special purpose districts for the implementation of structural and nonstructural practices that reduce flood damage. Structural practices must be approved by the chief engineer of the Division of Water Resources. https://agriculture.ks.gov/divisions-programs/division-of-conservation/flood-control-and-lakes-programs
(KDA-DoC)	Water Resources Cost Share Program	Provides state cost-share assistance to landowners for the establishment of enduring water conservation practices to protect and improve the quality and quantity of Kansas water resources. https://agriculture.ks.gov/divisions-programs/division-of-conservation/financial-assistance
(KDA-DoC)	Water Conservation Program	Provides financial incentives for voluntary retirements of private water rights in high priority areas. For more information about WRAP enrollment opportunities, please contact
Kansas Department of Agriculture – Division of Water Resources (KDA-DWR)	Community Assistance Program State Support Services Element	This program enhances the State's capability to provide floodplain management information and technical assistance to help local officials in NFIP and CRS participating communities. It also encourages nonparticipating communities to join the NFIP and CRS.
KDA-DWR	Floodplain Management Program	Program provides technical assistance for local, state and federal floodplain management, including managing the NFIP and floodplain ordinances and regulations adopted by city and county governments. https://agriculture.ks.gov/divisions-programs/dwr/floodplain/flood-safety-2
Kansas Department of Commerce (KDC)	Community Service Tax Credit	Program offers Kansas tax credits to for nonprofit organizations for contributions to approved projects. Projects eligible for tax credit awards include community service, crime prevention and health care https://www.kansascommerce.gov/programs-services/community-development-assistance/community-service-tax-credit-program/
Kansas Department of Health and Environment—Bureau of Environmental Remediation (KDHE-BER)	Abandoned Mine Land Program	Program provides for the remediation of sites that are an immediate threat to the health and safety of the public. http://www.kdheks.gov/mining/abandoned_mineland.htm
Kansas Department of Commerce (KDC)	CDBG Urgent Need Grant Abandoned Mine Land Program	This funding is intended to resolve emergency issues created by a severe disaster that pose a threat to the health and safety of citizens. https://www.kansascommercce.gov/programs-services/community-development-assistance/community-development-block-grant-program/urgent-need/
KDHE-BER	Kansas Brownfields Program	Programs to assist communities with the redevelopment of brownfields properties http://www.kdheks.gov/brownfields/index.html

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
KDHE-BER	State Water Plan Contamination Remediation Orphan Sites Program	Program provides Funding for the evaluation, monitoring, and remediation of contaminated groundwater or surface water sites and provides Funding to supply alternate water sources as an emergency http://www.kdheks.gov/ars/swp/index.html
Kansas Department of Transportation	Transportation Alternative Program	This is an annual competitive Federal Transportation Alternatives program that can be used for transportation enhancement activities that include: Vegetation Management - improvement of roadway safety; prevention of invasive species; providing erosion control. Stormwater Mitigation - pollution prevention and abatement activities to address stormwater management; water pollution prevention related to highway construction or due to highway runoff. Wildlife Management - reduction of vehicle-caused wildlife mortality; restoration and maintenance of connectivity among terrestrial or aquatic habitats. http://www.ksdot.org/bureaus/burtransplan/TransAlt.asp
Kansas Forest Service (KFS)	Community Forestry Program	Program provides assistance, education, and support to communities and municipalities in organizing urban and community forestry programs, identifying resource needs, setting priorities of work, and training city employees. https://www.kansasforests.org/community_forestry/
KFS	Rural Forestry Program	Professional foresters provide on-site forest management and agro-forestry analysis and recommendations through inventory of forests, woodlands and windbreaks. https://www.kansasforests.org/rural_forestry/
KFS	Firewise Program	The Kansas Firewise program offers prevention materials for homeowners to reduce the threat of wildland fire in rural and high-risk areas. https://www.kansasforests.org/fire_management/fireprevention.html
KFS	Forest Health Program	Program monitors the impacts of insects, diseases, drought, flooding and other health issues in forests, woodlands, windbreaks and conservation tree plantings by providing diagnosis and control recommendations and mitigation and planning for Emerald Ash Borer, Asian Bush Honeysuckles and other invasive species. https://www.kansasforests.org/forest_health/
KFS	Landowner Education	Provides information and education to farmers regarding the benefits of good forest management. This includes information about federal cost share practices including the Environmental Quality Incentives Program, Conservation Reserve Program, and the Riparian and Wetland Protection Program. https://www.kansasforests.org/forest_health/
KFS	Rural Fire Protection	Program provides fire support services to rural fire departments, including wildfire training, Smokey Bear fire prevention materials, and the acquisition and distribution of excess military vehicles for conversion to firefighting units.
Kansas Highway Patrol	Federal Preparedness Grant Program	Through this program, the Department of Homeland Security/FEMA provides Funding to states to prevent, respond to, and recover from

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
		acts of terrorism by enhancing and sustaining capabilities. https://www.kansashighwaypatrol.org/
Kansas State Fire Marshal's Office	Fire Prevention Program	Program focuses on structural inspection to ensure compliance with the Kansas Fire Prevention Code.
Kansas State Fire Marshal's Office	Hazardous Materials Program	Program provides training, planning, and analysis related to hazardous materials accidents/incidents and WMD events to help local facilities and local, state, and federal agencies before an event occurs.
Kansas Water Office (KWO)	Public Information and Education	This public education program provides information on water resource issues to the general public through publication of articles, pamphlets, news reports, etc. It also provides support for environmental education and local leadership development programs. https://www.kwo.ks.gov/
KWO	Stream Gauging Program	State financial assistance is provided for the operation of selected gauging stations operated by the U.S. Geological Survey. https://www.kwo.ks.gov/projects/stream-gaging-network
KWO	Technical Assistance to Water Users	Program provides technical assistance to municipalities, irrigators, and other groups to assist in the reduction of water use and improve water use efficiency. (For assistance contact KWO at 785-296-3185.
KWO	Water Resource Planning	As the water planning, policy, coordination and marketing agency for the state the Kansas Water Office works to maintain a comprehensive State Water Plan for the management, conservation and development of the water resources of the state. This includes the collection and compilation of information pertaining to climate, water and soil as related to the usage of water for agricultural, industrial and municipal purposes and the availability of water supplies in the several watersheds of the state; development of a state plan of water resources management, conservation and development for water planning areas; the development and maintenance of guidelines for water conservation plans and practices; and The establishment of guidelines as to when conditions indicative of drought exist. https://www.kwo.ks.gov/about-the-kwo/kwo

7.0 Plan Maintenance

7.1 – Hazard Mitigation Plan Monitoring and Evaluation

44 CFR 201.6 (c)(4) A plan maintenance process that includes: (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

The Kansas Region E Hazard Mitigation Plan will be updated then approved by FEMA every five years. During the five-year cycle, the plan will undergo continuous monitoring and evaluation to ensure that the policies, procedures, priorities, and state environment established in the plan reflect current conditions.

To achieve this, the MPC will meet annually after plan approval. If needed, additional meetings will take place during this timeframe. The State of Kansas State Hazard Mitigation Officer will determine the meeting dates and location and is responsible for sending invitations.

During the five-year evaluation phase, the MPC is responsible for assessing the effectiveness of the plan by:

- Reviewing the hazards and determining if any of them have changed
- Determining if there are new hazards that pose a risk to the state
- Ensuring goals and objectives are still relevant
- Determining if any actions have been completed or are deemed irrelevant
- Determining if new actions should be added
- Determining if capabilities have changed

In addition to these meetings, the MPC will monitor and evaluate the progress of mitigation projects via regular reports, site visits, and correspondence. Progress and viability of identified mitigation actions will be measured based on the following variables:

- The number of projects successfully implemented
- The breadth of disbursement of mitigation grant funds
- The disaster losses avoided over time
- Public awareness
- Success of completed mitigation projects in helping address and achieve identified goals and objectives
- Have the completed mitigation actions resulted in a safer Kansas Region E

In order to monitor the implementation of plan actions and the overall progress of plan goals, MPC members will report on the following information:

- How the actions from the mitigation strategy are being pursued and completed
- Are actions being prioritized
- How the plan goals and objectives are being carried out
- How mitigation funding mechanisms are being utilized
- How participating jurisdictions are receiving technical assistance

7.2 – Jurisdictional Maintenance Requirements

Kansas Region E and all participating jurisdictions will be tasked with plan monitoring, evaluation, and maintenance. All participating jurisdictions, led by MPC, will:

- Regularly monitor and evaluate the implementation of the plan
- When applicable, after a disaster event, evaluate the effectiveness of the plan
- Act as a think tank for all issues related to hazard mitigation planning
- Act as a clearinghouse for hazard mitigation ideas and activities
- Assist with the implementation of all identified actions with available resources
- Monitor all available funding opportunities for mitigation actions
- Coordinate the cycle for the revision and update of the mitigation plan
- Report on plan progress and recommended changes to the relevant governing bodies
- Inform and solicit input from the public

Each participating jurisdiction will also be responsible for promoting the integration of the hazard mitigation plan into all relevant plans, policies, procedures and ordinances.

7.3 – Plan Maintenance and Update Process

44 CFR 201.6 (c)(4) A plan maintenance process that includes: (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle."

Kansas Region E, the State of Kansas, and the MPC will facilitate a yearly plan review and the subsequent hazard mitigation plan revision and re-adoption process within the required five-year period.

Information from the annual meetings will be incorporated in to the plan update. Starting in calendar year 2022, the formal update process will begin. A thorough review and revision of the plan will take place, following all requirements detailed in 44 CFR 201.4, FEMA guidance documents, and DMA 2000. The following represents a general timeline for the next required plan revision.

- **Three years before plan expiration, Spring:** The MPC will begin updating the plan risk assessment. Hazards will be analyzed for continued relevancy and a review will be conducted to determine and new potential hazards.
- **Three years before plan expiration, Fall:** The MPC will begin updating the vulnerability assessment. Data will be gathered on jurisdictional assets, critical facilities, building stock values, crop losses, jurisdictional damages, etc.
- **Two years before plan expiration, Spring:** The MPC will review all information from previous meetings and determine if hazard mitigation goals and objectives are still relevant. Actions will be reviewed for currency and applicability. Work will begin on HMP revision.
- **Two years before plan expiration, Fall:** The MPC will evaluate the policies, programs, capabilities, and funding sources from the previous plan and plan revision to determine if they are still accurate and determine if additions are required.

- **One year before plan expiration:** Work will begin on the revision of the 2019 HMP.
- **Six months before plan expiration:** The MPC will review the final draft copy of the mitigation plan and make comments and updates if necessary. All participating jurisdictions and the public will be given an opportunity to review and comment on draft HMP.
- **Two months before plan expiration:** Formal submittal to FEMA for re-approval.

As part of the plan maintenance process, and consistently during the five-year HMP approval period, the MPC will continually monitor all elements of the plan, including:

- The incorporation of the HMP into other planning mechanisms
- All revisions and updates to the HMP
- Continued public participation

This monitoring will be done through outreach efforts to include:

- Email communication
- Phone communication
- In person communication at meetings, relevant conferences, and local planning events

Through consistent monitoring the MPC will then be able to efficiently incorporate these elements into the next plan revision.

Upon each successive revision, the plan will need to be re-adopted by all participating jurisdictions. Circumstances, including a major disaster or a change in regulations or laws, may modify the required five-year planning cycle.

7.4 – Post-Disaster Declaration Procedures

Following a disaster, each participating jurisdiction and the MPC may review the plan to determine if any additional actions need to be identified, additional funding has become available, or any identified actions need to be re-prioritized.

7.5 – Incorporation of HMP into Other Planning Mechanisms

44 CFR 201.6 (c)(4)(ii) 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.

The hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various county and local plans. Under the leadership of the MPC, it is hoped that when each of these other plans is updated, they will be measured against the contents of this HMP.

Below is a list of the various jurisdictional planning efforts, either solely or jointly administered, and relevant planning documents. While each plan can stand alone, each participating jurisdiction, under the

leadership of their MPC member, will actively work to incorporate relevant parts of this hazard mitigation plan into the following:

- All participating jurisdictions Codes and Ordinances
- All participating jurisdictions Comprehensive Plans
- All participating jurisdictions Critical Facilities Plans
- All participating jurisdictions Economic Development Strategic Plans
- All participating jurisdictions Emergency Operations Plans
- All participating jurisdictions Flood Mitigation Assistance Plan
- All participating jurisdiction Land-Use Plans
- Community Wildfire Protection Plans

Additionally, in cooperation with the MPC, each participating jurisdiction will be actively courted on incorporating elements of this hazard mitigation plan for any relevant plan, code or ordinance revision or creation.

Each participating jurisdiction has committed to actively encourage all departments to implement actions that minimize loss of life and property damage. Whenever possible, each participating jurisdiction will use existing plans, policies, procedures and programs to aid in the implementation of identified hazard mitigation actions. Potential avenues for implementation may include:

- Budget revisions or adoptions
- Capital improvement plans
- General or master plans
- Hiring of staff
- Land use planning
- Operation plans
- Ordinances
- Stormwater planning

Participating jurisdictions are encouraged to utilize all available budget avenues for the completion of hazard mitigation items. Budgetary options may include:

- Annual budgets
- Application for grant funding
- Departmental budgets
- In-kind donations

Where appropriate, the MPC will take the lead in integrating this HMP into overarching, countywide plans, code, ordinances and any other relevant documents, policies or procedures.

7.6 – Continued Public Involvement

44 CFR 201.6 (c)(4)(iii) Discussion on how the community will continue public participation in the plan maintenance process.

Public participation is an important part of the continued mitigation planning process. Every effort will be made to keep the public informed on both relevant mitigation issues and the five-year plan revision cycle. Strategies for continued public involvement may include:

- Postings on electronic media, to include websites
- Notifications, when possible, in local media
- Making plans available for review in public locations
- A review of local mitigation strategies and goals
- A review completed and remaining hazard mitigation actions

Appendix A

Adoption Resolutions

RESOLUTION 2020-01

A RESOLUTION ADOPTING THE KANSAS HOMELAND SECURITY REGION E HAZARD MITIGATION PLAN AND RESCINDING RESOLUTION 2015-10, A RESOLUTION ADOPTING THE BARTON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, ADOPTED MARCH 16, 2015

WHEREAS, areas of Barton County, Kansas are vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the Board of County Commissioners of Barton County, Kansas recognizes the threats that natural hazards pose to people and property within the county; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

WHEREAS, an adopted Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

WHEREAS, Barton County, Kansas fully participated in the FEMA prescribed mitigation planning process to prepare this Multi-Hazard Mitigation Plan; and

WHEREAS, the Kansas Division of Emergency Management and FEMA Region VII officials have reviewed the Kansas Homeland Security Region E Hazard Mitigation Plan, and approved it contingent upon this official adoption of the participating governing body; and

WHEREAS, Barton County, Kansas desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Kansas Homeland Security Region E Hazard Mitigation Plan; and

WHEREAS, adoption by the Board of County Commissioners of Barton County, Kansas demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this plan, and

WHEREAS, adoption of this resolution legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

NOW, THEREFORE, BE IT RESOLVED, by the Board of County Commissioners of Barton County, Kansas, that Barton County adopts the Kansas Homeland Security Region E Hazard Mitigation Plan as an official plan; and

FURTHER, that Resolution 2015-10, A Resolution Adopting the Barton County Multi-Jurisdictional Hazard Mitigation Plan, Adopted March 16, 2015, is hereby rescinded.

FURTHER, that this Resolution shall take effect immediately upon its passage and publication in the official County newspaper, The Great Bend Tribune.

FURTHER, that the Barton County Emergency Management Director of Barton County, Kansas shall submit this Adoption Resolution to the Kansas Division of Emergency Management.

ADOPTED this 6th day of January, 2020.

BOARD OF COUNTY COMMISSIONERS

Jennifer Schartz, Chairman

James R. Daily, Commissioner

Don Davis, Commissioner

Homer Kruckenberg, Commissioner

Kenny Schremmer, Commissioner

ATTEST:

Donna Zimmerman,
County Clerk

BARTON COUNTY KANSAS SEAL COUNTY CLERK

APPROVED AS TO FORM:

Patrick Hoffman,
County Counselor

Model Resolution

Resolution # _____: **Adopting the Kansas Homeland Security Region E Hazard Mitigation Plan**

Whereas, the (Name of Government/District/Organization) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

Whereas, the (Name of Government/District/Organization) fully participated in the FEMA prescribed mitigation planning process to prepare this Multi-Hazard Mitigation Plan; and

Whereas, the Kansas Division of Emergency Management and FEMA Region VII officials have reviewed the Kansas Homeland Security Region E Hazard Mitigation Plan, and approved it contingent upon this official adoption of the participating governing body; and

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Kansas Homeland Security Region E Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the (Name of Government/District/Organization) demonstrates the jurisdictions' commitment to fulfilling the mitigation goals and objectives outlined in this plan, and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the Kansas Homeland Security Region E Hazard Mitigation Plan as an official plan; and

Be it further resolved, the (Name of Government/District/Organization) will submit this Adoption Resolution to the Kansas Division of Emergency Management and FEMA Region VII officials to enable the plan's final approval.

_____:Date _____: Approved by

Appendix B

FEMA Approval Documents

U.S. Department of Homeland Security
FEMA Region VII
11224 Holmes Road
Kansas City, MO 64131

FEMA

December 11, 2019

Angee Morgan, Deputy Director
Kansas Division of Emergency Management
2800 S.W. Topeka Boulevard
Topeka, Kansas 66611-1287

Subject: Review of the Region E, Kansas Hazard Mitigation Plan

Dear Ms. Morgan:

The purpose of this letter is to provide the status of the above referenced Local Hazard Mitigation Plan, pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and the Local Multi-Hazard Mitigation Planning Guidance. The Local Hazard Mitigation Plan Review Tool documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. FEMA's approval will be for a period of five years effective starting the date of receipt of adoption documentation. Formal adoption documentation must be submitted to the Regional office within one calendar year of the date of this letter, or the plan will need to be updated and resubmitted for review.

Prior to the expiration of the plan the community will be required to review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

Local Jurisdiction	Date Submitted	Date Completed	Date of Plan Adoption	Date of Plan Expiration	Review Status
Region E	20 November 2019	6 December 2019			Approved pending FEMA's receipt of adoption documentation

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

Teri A. Mayer
Mitigation Division Director (Acting)

Appendix C

Meeting Minutes and Sign-In Sheets

To	Region E Mitigation Planning Committee
Through	Jeanne Bunting, Mitigation Planner Kansas Division of Emergency Management (KDEM)
From	Matt Eyer
Tel / E-mail	Blue Umbrella, 303-552-1181, matt@blueumbrella.co
Date	May 22 and 23, 2019
Subject	Minutes from the Region E Mitigation Planning Meeting

This document is a record of attendance and a summary of the issues discussed during the above Kickoff meeting. Topics covered during the meeting included: (1) an introduction to the purpose of hazard mitigation planning, (2) the benefits of a multi-jurisdictional approach, (3) the reasons for the regional mitigation planning process, (4) grant programs linked to an approved plan and (5) action items in the previous county hazard mitigation plans. The hazard mitigation planning process was reviewed to include requirements for public involvement and the use of data collection guides, and the new action criteria. The planning committee reviewed the list of hazards to be used as a part of the regional plan. The group discussed mitigation actions and the availability of grant programs during the meeting. The meeting concluded with a discussion of the next steps in the planning process.

Attendees

See attached sign in sheets

Introductions

Matt Eyer began the meeting by welcoming and thanking the attendees. Participants introduced themselves and identified what jurisdiction they represented.

Introduction to Hazard Mitigation Planning

Matt Eyer, the plan author contractor, presented information on the purpose and requirements of the Disaster Mitigation Act of 2000. The attendees were reminded that this is a regional planning effort which will update the current Region E mitigation plan. The presentation also addressed the benefits for jurisdictions participating in this mitigation plan update, including eligibility for federal hazard mitigation assistance funding programs.

Matt Eyer described the benefits of participating in a multi-jurisdictional plan as improving coordination and communication among local jurisdictions and that these hazards do not stop at jurisdictional boundaries thus this multi-jurisdictional plan allows for a more comprehensive approach. The group also heard information regarding the significant cost savings being realized by the regional approach to planning. The regional approach now being used allows planning services to be provided to each county for the update at no cost to the county. Matt Eyer with Blue Umbrella will be completing the Region E mitigation plan for committee review.

Mr. Eyer also described the role of the Mitigation Planning Committee (MPC). Each jurisdiction participating in development of the plan must meet the following minimum requirements:

- Designate a representative to serve on the Region E Hazard Mitigation Planning Committee, which will meet twice during the planning process, Emergency Managers will meet three times.
- Provide data for and assist in the development of the updated risk assessment that describes how various hazards impact your jurisdiction,
- Provide data to describe current capabilities,

- Develop/update mitigation actions (at least one) specific to your jurisdiction,
- Provide comments on plan drafts as requested,
- Inform the public, local officials, and other interested parties about the planning process and provide opportunities for them to comment on the plan, and
- Formally adopt the mitigation plan.

Planning for Public Involvement

The local/regional hazard mitigation plan requirements state that the public must have the opportunity to comment on the plan. The public will be given two opportunities to comment on the plan, once during the drafting stage and another when the plan is complete in the final draft stage. KDEM is planning to utilize a questionnaire on SurveyMonkey.com to ask the public's opinion about hazards that affect them during the drafting stage. The MPC members in the county are also requested to post the SurveyMonkey.com link, once available, on their websites and newsletters to the public and to distribute the survey as widely as possible.

Data Collection Process

The participating jurisdictions at the meeting were provided hard copies of Data Collection Guides. Local County Emergency Management Agencies will follow-up with jurisdictions that were not in attendance at this meeting to provide an overview of the process being used and copies of data collection guides for completion. Mr. Eyer briefed on the Data Collection Guides and reminded the attendees that they are specific for local units of government and schools. There are two different guides, one for local governments, and one for schools and universities. The jurisdictions were requested to provide data regarding hazards that had occurred in their jurisdiction since the last plan update (2014) for the 22 hazards that are in the Regional Plan. The Data Collection Guides were requested to be returned to Jeanne Bunting July 2019.

Plan Format/ Regional and Countywide Risk Assessment

The list of hazards in the State of Kansas plan is the list that is being used for the regional plans. All of the hazards included in the State Plan were included in the current plan for the counties in Region E. Blue Umbrella staff will be updating the regional hazard ranking using the State Plan methodology for hazards in their current plan.

Hazard Mitigation Assistance Grants Available Linked to Approved Plan

The following four Hazard Mitigation Assistance grant programs were outlined, priority activities discussed, deadline of grants, and current funds available for:

- Hazard Mitigation Grant Program (HMGP)
- Pre-disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- POST HMGP Fire

Other state and federal grant programs for mitigation projects were also mentioned.

Mitigation Actions

The planning committee was provided an introduction to update and development of mitigation actions. Jurisdictional representatives were requested to provide updates as to: (1) action status – in a measurable format, i.e. 100% complete. They were also advised of the FEMA SMART action criteria and the four categories for actions. The group was reminded that each participating jurisdiction must have at least one action and that all NFIP jurisdictions must have at least two NFIP-related actions. The date for the final planning meeting will be sent to each agency. At that final meeting, the mitigation actions for the plan will be prioritized.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- July 2019: Data Collection Guides Due to KDEM
- August 2019, TBD: Meeting #2 for Emergency Management Officials
- TBD (Beginning of November 2019): Meeting #3 All Committee Members – Action Priorities
- November 2019 (end of): Submit Plan to FEMA

Name	Jurisdiction	Phone	Email
Douglas Freund	Pratt Co. Road	620-388-1960	dfreund@prattcounty.org
Tim Branscom	Pratt Co. EM	620-672-4132	pcem@prattcounty.org
Darcie Van Der Vyver	Pratt Co. Health Dept.	316 293-7196	darcievv@prattcounty.org
Dave Schmidt	Skyline Schools, USD 438	620-672-5651	dschmidt@skylineschools.org
Justin Schwab	PCC	620-388-2367	Justins@Prattcc.edu
Donna Meier Pfeifer	PCC	620-770-1148	DonnaMP@Prattcc.edu
Lola Shumway	City of Pratt	620-770-2646	LolaShumway@cityofprattKS.com
Brad Blankenship	City of Pratt	620-672-3866	bblankenship@cityofprattks.com
Russell Rambat	City of Pratt	620 672 3864	rrambat@cityofprattKS.com
Scott Harris	Pratt County EMS	620 508 1154	sharris@prattcounty.org
Robert Lamatsch	Ninnescah Electric	620-672-1602	rlamatsch@ninnescah.com
Doug Meyer	City of Pratt	620-770-0141	DMeyer@cityofprattKS.com
James White	Pratt Co. Sheriff	620-770-0114	jwhite@pratt50.org
Kerri Boldt	USD 382 Pratt	620-770-2125	Kerri.boldt@usd382.com

Kansas Region E Hazard Mitigation Meeting May 23, 2019 1:00pm

Name	Jurisdiction	Email	Phone
Cody Schmidt	USD 428	cody.schmidt@usd428.net	620-617-3833
Dirk Davis	USD 428	dirk.davis@usd428.net	620-617-5193
Randy Still	Pawnee Watershed District	Pwdmanager@unitedwireless.com	6203575014
ISAAC ABERSON	PAWNEE WATERSHED DISTRICT	PWDMANAGER2@UNITEDWIRELESS.COM	
Phillip Nusser	Stafford County	coshop@gbta.net	620-546-5552
Richard Nelson	Edwards County	rnelson@edwards.ks.coxmail.com	620-339-9184
Amy Miller	Barton County	emermgnt@bartoncounty.org	620-793-1919
Joel Davis	Pawnee County	joel.davis@pawneecountyks.org	6208042717
Bradley Eitts	City of Larned	baitts@cityoflarned.com	620/285-8500
Troy Langdon	USD 495	troy.langdon@usd495.net	620-285-2157
Mark Wagner	Pawnee EMA	mark.wagner@pawneecountyks.org	620-285-5285
DAVID BAILEY	GREAT BEND POLICE	Lbailey@greatbendks.net	620-793-4120
Luke McCormick	Great Bend Fire/EMS	lmccormick@greatbendks.net	6207934120
Helen Thorne - City of Rozel		rozelcity@gbta.net	620-527-4399

To	**Region "E" Hazard Mitigation Planning Committee**
Through	**Jeanne Bunting, Mitigation Planner** **Kansas Division of Emergency Management (KDEM)**
From Tel / E-mail	**Jeanne Bunting, State Hazard Mitigation Officer** **Kansas Division of Emergency Management (KDEM)**
Date	**21 August, 2019**
Subject	**Minutes from the Region "E" Mitigation Planning Meeting held on 21 August 2019, at the City of Pratt for the counties within the region.**

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) Strategy, (2) Goals, and (3) actions, 4) final steps, 5) draft plan. The meeting concluded with a discussion of the next steps in the planning process and the necessity to open the plan for public comment.

Attendees

Name	Organization	County

See attached.

Agenda

The meeting was scheduled in order to finalize the draft plan of Region E. Of the 8 counties, 3 were represented. Two had health concerns that could not attend, three had prior commitments. The Regional Co-ordinnator, Jim Leftwich, is going to get with the 5 who could not make it to ensure their counties facilitate the paper work needed. Matt Eyer, the plan author, reviewed the strategy, goals, and went in depth on the next steps, which include public comments.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **November 6th, 2019 – Final Meeting**
- **November 20, 2019 – Submit plan to FEMA**

//s//
Jeanne Bunting, State Hazard Mitigation Officer, KDEM

Region E
2nd Mtg
Pratt, KS @ 1300

Name	Title	County	Signature
Jeanne Bunting	SHMO	State	
Jim Leftwich	KDEM		
Tim Branscom	Coordinator	Pratt Co EM	
Amy Miller	Emergency Mgr.	Barton County EM	
Lorena Lothman for Mark Wagner	EM	Pawnee Co.	

To	**Region E Hazard Mitigation Planning Committee**
Through	**Jeanne Bunting, Mitigation Planner** **Kansas Division of Emergency Management (KDEM)**
From Tel / E-mail	**Jeanne Bunting, State Hazard Mitigation Officer** **Kansas Division of Emergency Management (KDEM)**
Date	**6 November, 2019**
Subject	**Minutes from the Region E Final Mitigation Planning Meeting**

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) Strategy, (2) Goals, and (3) actions, 4) final steps, 5) draft plan. The meeting concluded with a discussion of the next steps in the planning process and the necessity to open the plan for public comment.

Attendees

Name	Organization	County

See attached.

Agenda

The meeting was scheduled in order to finalize the draft plan of Region E. Matt Eyer, the plan author, reviewed the strategy, goals, and went in depth on the next steps, which include public comments.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **November 2019 – Submit Plan to FEMA**

//s//
Jeanne Bunting, State Hazard Mitigation Officer, KDEM

Barton County Region E

Name (Legibly!)	County/Organization (Legibly!)	Title (Legibly!)
Steve Sipes	Stafford Co. USD 349	Maintence Supervisor
Richard Wilson	Edwards Co	Public Work Director + EM
Amy Miller	Barton Co Emerg Mgnt	Emergency Mgnt. Director
Mark Wagner	Pawnee Co. "	"
Mike Gibson	Barton Co	Major Capital Ks
Randy Still	Pawnee Hodgeman Pawnee Watershed	manager
Ron Pfenninger	Pawnee Watershed	Bd. Member
ISAAC ABERSON	PAWNEE WATERSHED	ASST. MANAGER
Chris Komarek	City of Ellinwood	City Administrator
Cody Schmidt	USD 428	
Scott Younie	Leisure Homestead Assoc.	CEO
Jackie Holmberg	Barton + Stafford - Ark Valley REC	General Manager
Lois Ritterhouse	City of Albert	City Clerk
Phil Nusser	Stafford County	EM
Kirsty Morgan	FEMA	Mit. Grants Manager
Jeanne Dunting	KDEM	SHMO
Matt Eyer	Blue Umbrella	President

Pratt Co. Region E

Name (Legibly!)	County/Organization (Legibly!)	Title (Legibly!)
Mike Loreg	Barber Co. EM	Director
Tim Branscom	Pratt Co EM	Coordinator
Poritt Lenertz	Comanche County EM	Director
MACK BUCK	North Barber County School & Med Lodge City Fire	Superintendent & Fire Chief
Sandy Smith	Medicine Lodge Memorial Hospital	RN, Emergency Management Director
RAY SPEGMAN	Kiowa County EM	EM
Myla Miller	Barber Co. School South Barber	Superintendent
Lola Shumway	City of Pratt	CFM
BRAD BLANKENSHIP	CITY OF PRATT	BUILDING INSPECTOR
Russell Rambat	City of Pratt	Public Works
Andrea Taylor	Kiowa County EM	Admin Assistant
BRUCE PINKALL	CITY OF PRATT	CITY MANAGER
Brena Perschbacher	Kiowa District Hospital	Material Manager
Sandra Davis	Kiowa District Hospital	Energency Preparedness Coordinator