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County Profile

McPherson County

Twin Platte NRD Multi-Jurisdictional Hazard Mitigation Plan Update

2021

Local Planning Team

Table MPH.1: McPherson County Local Planning Team

Name	Title	Jurisdiction
Thomas Burch	Sheriff/Emergency Manager	McPherson County
Brett Nason	County Commissioner	McPherson County

Location, Geography, and Climate

In the western half of Nebraska, McPherson County is bordered by Lincoln, Keith, Arthur, and Logan Counties. The total area of McPherson County is 860 square miles. Most of McPherson County lies in the Sandhills topographic region.

Climate

The table below compares the county’s climate indicators with those of the entire state. Climate data are helpful in determining if certain events are higher or lower than normal. For example, if the high temperatures in the month of July are running well into the 90s, high heat events may be more likely which could impact vulnerable populations.

Table MPH.2: McPherson County Climate

	McPherson County	State of Nebraska
July Normal High Temp ¹	88.0°F	87.4°F
January Normal Low Temp ¹	11.8°F	13.8°F
Annual Normal Precipitation ²	23.0"	23.8"
Annual Normal Snowfall ²	35.1"	25.9"

Source: NCEI 1981-2010 Climate Normals¹, High Plains Regional Climate Center, 1981-2010²
 Precipitation includes all rain and melted snow and ice.

Transportation

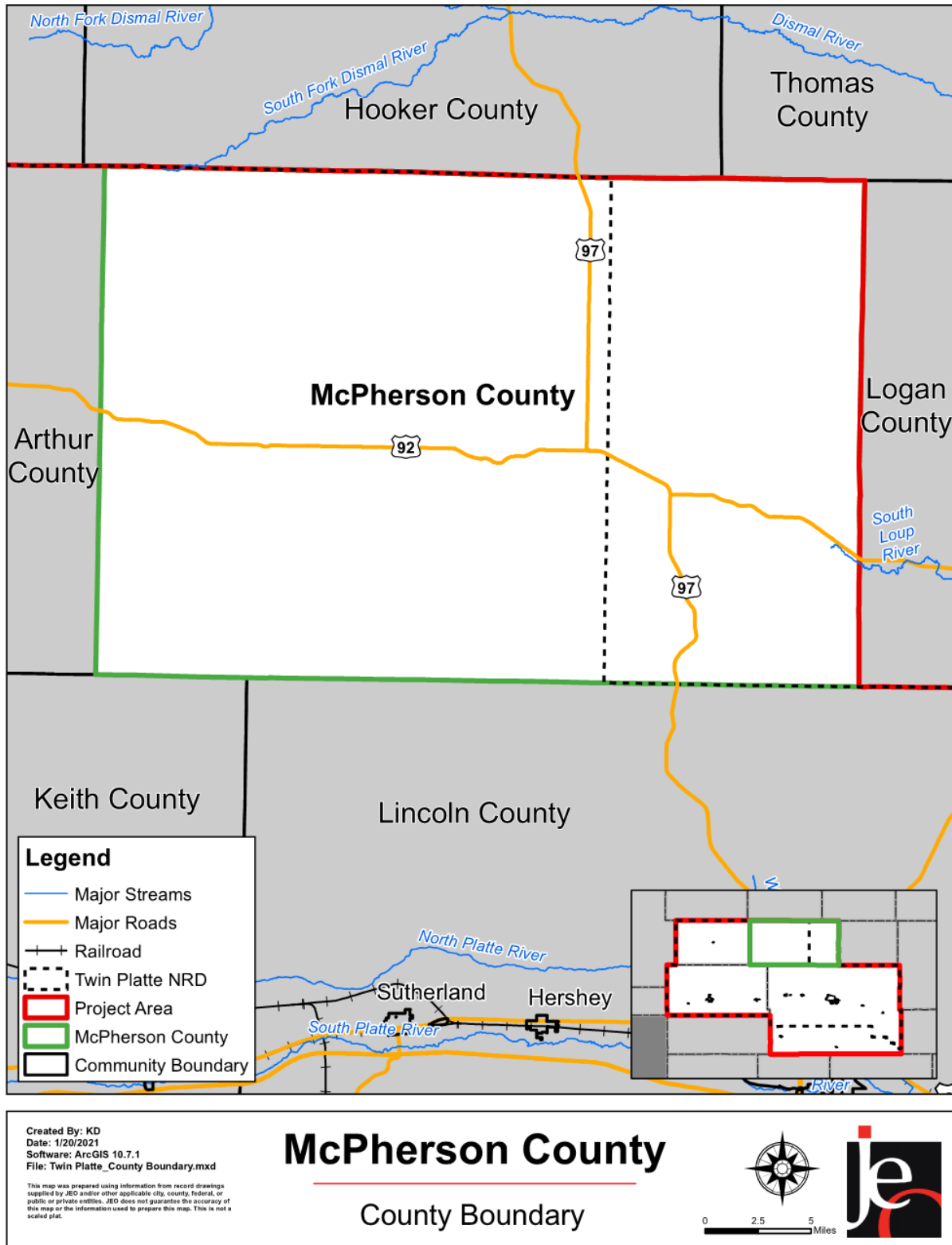
McPherson County’s major transportation corridors include Nebraska Highways 97 and 92. The most traveled route is Highway 92 with an average of 605 vehicles daily, 50 of which are trucks.³ Fuels, petroleum products, propane, fertilizer, and other agricultural chemicals are transported along both highways and other local routes. No chemical spills have occurred in recent years. However, a fatal accident occurred recently involving a semi-truck on Highway 97. No rail lines travel through the county. Transportation information is important to hazard mitigation plans because it suggests possible evacuation corridors, as well as areas more at risk of transportation incidents. Most of the county’s critical facilities are located near the two highways which increases vulnerability.

1 National Centers for Environmental Information. “1981-2010 U.S. Climate Normals.” Accessed July 2020.
<https://www.ncdc.noaa.gov/cdo-web/datatools>.

2 High Plains Regional Climate Center. “Monthly Climate Normals 1981-2010 – Stapleton 5 W.” Accessed July 2020.
<http://climod.unl.edu/>.

3 Nebraska Department of Roads. 2018. “Interactive Statewide Traffic Counts Map.” [map].
<https://gis.ne.gov/portal/apps/webappviewer/index.html?id=bb00781d6653474d945d51f49e1e7c34>.

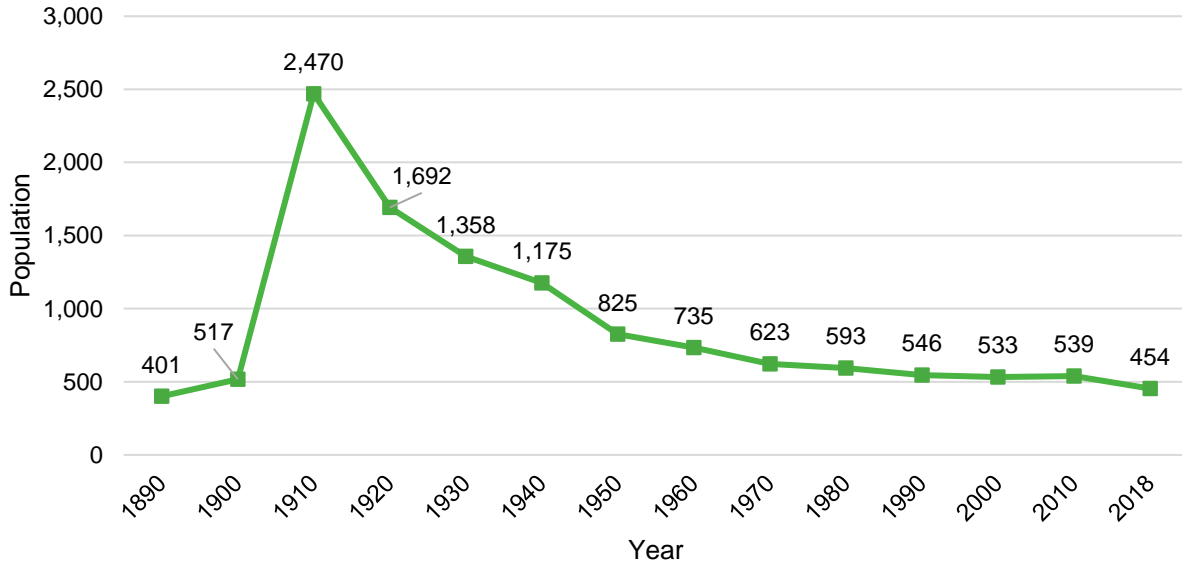
Figure MPH.1: McPherson County



Demographics, Economics, and Housing

The following figure displays the historical population trend from 1890 to 2018.⁴ This figure indicates that the population of McPherson County has been decreasing since 1910. A declining population can lead to more unoccupied and unmaintained housing that is then at risk to high winds and other hazards. Furthermore, with fewer residents, tax revenue decreases for the county, which makes implementing mitigation projects more fiscally challenging.

Figure MPH.2: Population 1890 - 2018



Source: U.S. Census Bureau

The following table indicates McPherson County has a similar percentage of people under the age of five but many more people over the age of 64 when compared to the state. This is relevant to hazard mitigation because the very young and elderly populations may be at greater risk from certain hazards than others. For a more elaborate discussion of this vulnerability, please see Section Four: Risk Assessment.

Table MPH.3: Population by Age

Age	McPherson County	State of Nebraska
<5	6.8%	6.9%
5-64	71.2%	78.1%
>64	22%	15%
Median	43.6	36.4

Source: U.S. Census Bureau³

The following table indicates that both median household income and per capita income for the county are less than the State of Nebraska. Median home value and rent are also both less than the rest of the state. These economic indicators are relevant to hazard mitigation because they indicate the relative economic strength compared to the state. Areas with relatively low economic indicators may be less resilient during hazardous events.

⁴ United States Census Bureau. 2018. "S0101: Age and Sex." [database file]. <https://data.census.gov/cedsci/>.

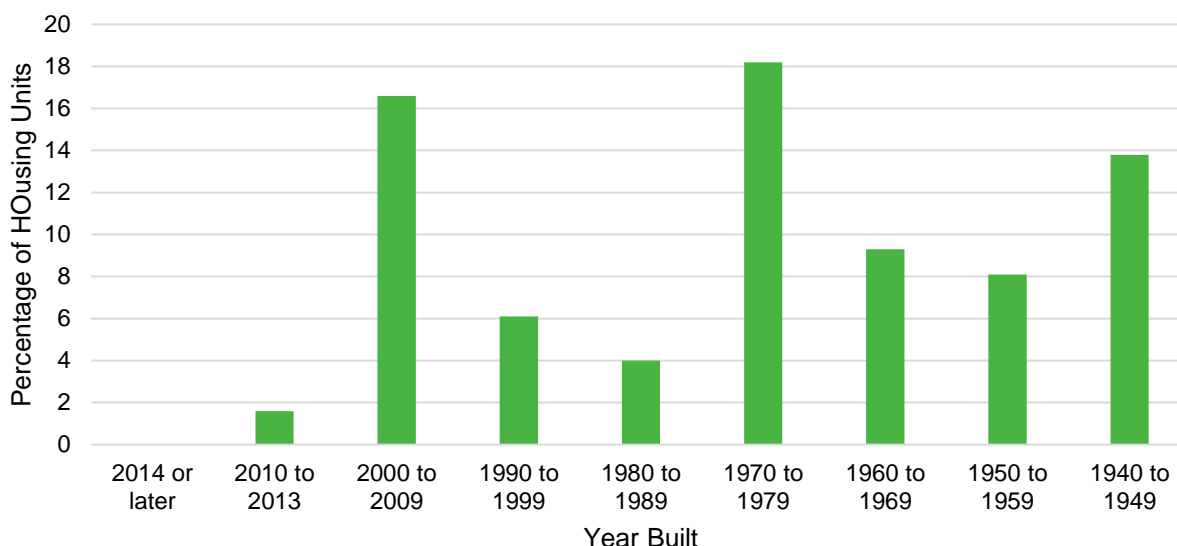
Table MPH.4: Housing and Income

	McPherson County	State of Nebraska
Median Household Income	\$48,882	\$59,116
Per Capita Income	\$26,384	\$31,101
Median Home Value	\$119,300	\$147,800
Median Rent	\$714	\$805

Source: U.S. Census Bureau^{5,6}

The following figure indicates that most of the housing in McPherson County was built between 1970 and 1979 (18.2%). Housing age can serve as an indicator of risk, as structures built prior to the development of state building codes may be at greater risk. According to 2018 ACS 5-year estimates, the county has 203 housing units with 82.2% of those units occupied. There are approximately 20 mobile homes scattered across the county. Residents that live in mobile homes may be more vulnerable to the impacts of high winds, tornadoes, and severe winter storms if not anchored correctly.

Figure MPH.3: Housing Units by Year Built



Source: U.S. Census Bureau⁴

Table MPH.5: Housing Units

Jurisdiction	Total Housing Units				Occupied Housing Units			
	Occupied		Vacant		Owner		Renter	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
McPherson County	203	82.2%	44	17.8%	139	68.5%	64	31.5%
Nebraska	754,063	90.8%	76,686	9.2%	498,567	66.1%	255,496	33.9%

Source: U.S. Census Bureau⁴

Major Employers

According to 2016 Business Patterns Census Data, McPherson County had seven business establishments. The following table presents the number of establishments, number of paid employees, and the annual payroll in thousands of dollars.

⁵ United States Census Bureau. 2018. "DP04: Selected Housing Characteristics." [database file]. <https://data.census.gov/cedsci/>.

⁶ United States Census Bureau. 2018. "DP03: Selected Economic Characteristics." [database file]. <https://data.census.gov/cedsci/>.

Table MPH.6: Business in McPherson County

	Total Businesses	Number of Paid Employees	Annual Payroll (In Thousands)
Total for All Sectors	7	22	531,000

Source: U.S Census Bureau⁷

Agriculture is important to the State of Nebraska's economic fabric. McPherson County's 109 farms cover 488,982 acres of land, about 88.8% of the county's total area. Crop and livestock production are the visible parts of the agricultural economy, but many related businesses contribute to agriculture by producing, processing, and marketing farm products. These businesses generate income, employment, and economic activity throughout the region.

Table MPH.7: Agricultural Inventory

Agricultural Inventory	
Number of Farms with Harvested Cropland	48
Acres of Harvested Cropland	18,860

Source: USDA Census of Agriculture, 2017⁸

Future Development Trends

Over the past five years, there has been very little change in the county. Two or three new homes were built, but no major developments occurred. None of the new construction was in the floodplain or other hazardous areas. According to the 2018 American Community Survey estimates, McPherson County's population is declining. The local planning team attributed this to the increasing mechanization in agriculture, reducing demand for farm and ranch labor. In addition, the Union Pacific Railroad in North Platte has been downsizing employment which affected a portion of the population that commuted to work there. In the next five years, no new housing or business developments are planned.

Parcel Improvements and Valuation

The planning team acquired GIS parcel data from the County Assessor to analyze the location, number, and value of property improvements (e.g., buildings, garages, sheds etc.) at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in the following table.

Table MPH.8: Parcel Improvements and Value in the Floodplain

Number of Improvements	Total Improvement Value	Number of Improvements in Floodplain*	Value of Improvements in Floodplain*	Percentage of Improvements in Floodplain*
336	\$23,683,877	123	\$8,108,358	36.6%

Source: County Assessor, 2018

*Based off a HAZUS created floodplain.

7 United States Census Bureau. 2016. "County Business Patterns and 2016 Nonemployer Statistics" [database file]. <https://factfinder.census.gov>.

8 U.S. Department of Agriculture. "2017 Census of Agriculture." <https://www.nass.usda.gov/Publications/AgCensus/2017/>.

Community Lifelines

Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environment and Energy, there are two chemical storage sites located in McPherson County. The following table lists their name, location, and floodplain status. Both James Street and Highway 92 may be affected if a large spill occurred at either fixed site location. Residents near both sites are educated about the threat and appropriate response to a spill.

Table MPH.9: Chemical Storage Fixed Sites

Facility Name	Location	In Floodplain (Y/N)*
Neal Oil & Auto Center Inc	Jct Highway 92 & James St, Tryon, NE	N
Neal Oil & Auto Center Inc	420 Highway 92, Tryon, NE	N

Source: Nebraska Department of Environment and Energy, 2020⁹

*Based off a HAZUS created floodplain.

Critical Facilities

Each participating jurisdiction identified critical facilities vital for disaster response, providing shelter to the public, and essential for returning the jurisdiction's functions to normal during and after a disaster per the FEMA Community Lifelines guidance. Critical facilities were identified during the original planning process and updated by the local planning team as part of this plan update. The following table and figure provide a summary of the critical facilities for the jurisdiction.

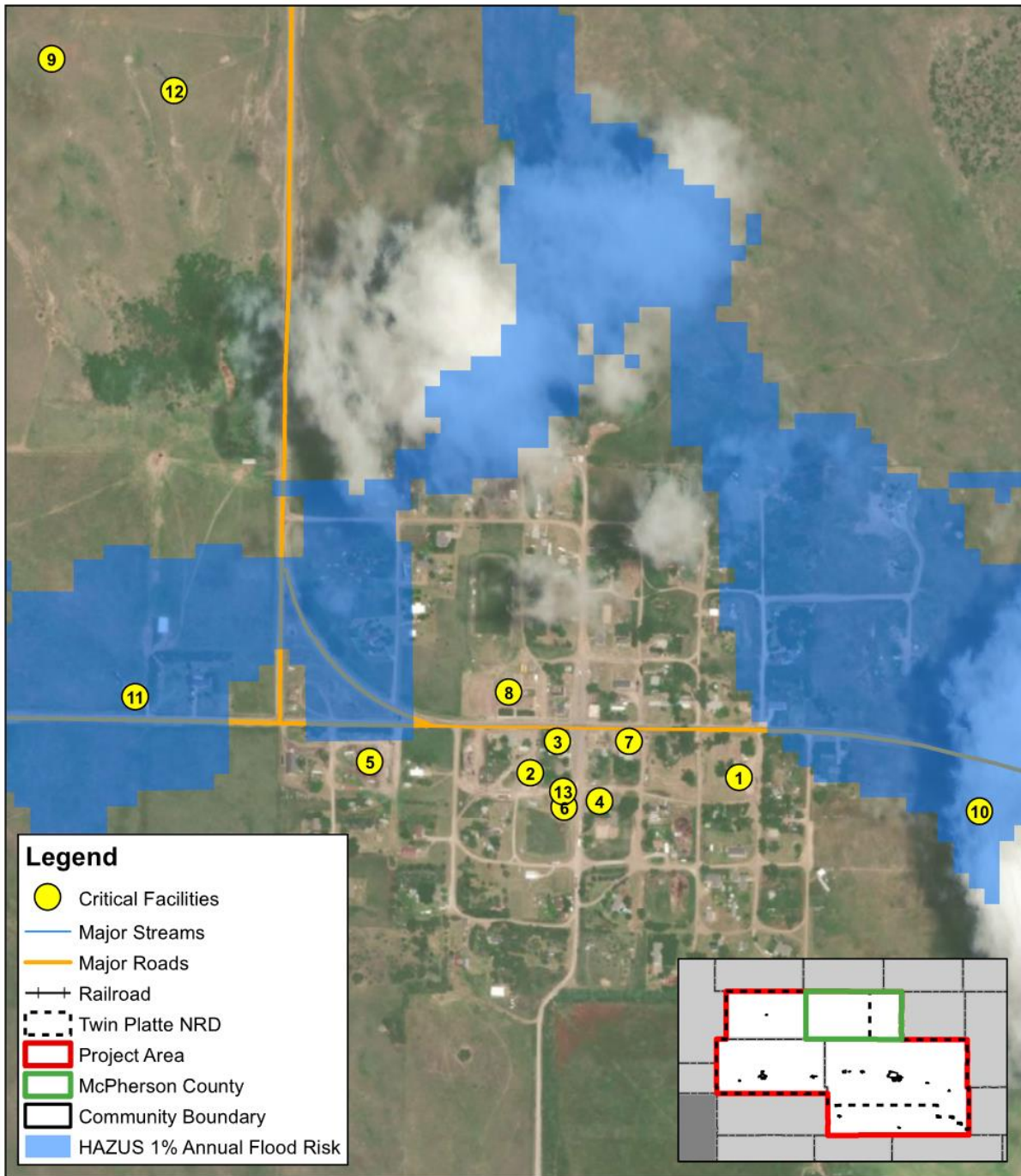
Table MPH.10: Critical Facilities

CF Number	Name	Community Shelter (Y/N)	Generator (Y/N)	Floodplain (Y/N)*
1	Bulk Fuel Depot	N	N	N
2	County Shop/Community Building	N	Y	N
3	Courthouse/Sheriff's Office	N	Y	N
4	Elementary School	N	N	N
5	Feed Mill	N	N	N
6	Fire Hall	N	Y	N
7	Gas Station	N	N	N
8	High School	Y	N	N
9	Radio Tower	N	Y	N
10	Substation	N	N	Y
11	Verizon Cell Tower	N	Y	Y
12	Viaero Cell Tower	N	Y	N
13	Warning Siren	N	Y	N

*Based off a HAZUS created floodplain.

9 Nebraska Department of Environment and Energy. "Search Tier II Data." Accessed September 2020. <https://deq-iis.ne.gov/tier2/tier2Download.html>.

Figure MPH.4: Critical Facilities



Created By: KD
 Date: 1/20/2021
 Software: ArcGIS 10.7.1
 File: Twin Platte_County Boundary.mxd

McPherson County

Critical Facilities

0 0.05 0.1 Miles

This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plan.

Note: There is no DFIRM for the county. Floodplain was generated using the HAZUS program.

Governance

The county’s governmental structure impacts its capability to implement mitigation actions. McPherson County is governed by a Board of Commissioners. The county also has the following offices and departments:

- County Clerk
- County Assessor
- Emergency Manager
- Highway Superintendent
- County Road Department
- Planning & Zoning
- Sheriff
- State Patrol
- Rural Fire and Rescue

Capability Assessment

The capability assessment consisted of a review of local existing policies, regulations, plans, and programs with hazard mitigation capabilities. The following tables summarize the county’s planning and regulatory capability; administrative and technical capability; fiscal capability; educational and outreach capability; and overall capability to implement mitigation projects.

Table MPH.13: Capability Assessment

Survey Components/Subcomponents		Yes/No
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Economic Development Plan	Yes
	Local Emergency Operations Plan	Yes
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	No
	Building Codes	Yes
	National Flood Insurance Program	No
	Community Rating System	No
Other (if any)	Community Wildfire Protection Plan	
Administrative & Technical Capability	Planning Commission	Yes
	Floodplain Administration	No
	GIS Capabilities	Yes
	Chief Building Official	No
	Civil Engineering	No
	Local Staff Who Can Assess County's Vulnerability to Hazards	No
	Grant Manager	No
	Mutual Aid Agreement	Yes

Survey Components/Subcomponents		Yes/No
	Other (if any)	
Fiscal Capability	Capital Improvement Plan/ 1- & 6-Year Plan	No
	Applied for grants in the past	Yes
	Awarded a grant in the past	Yes
	Authority to levy taxes for specific purposes such as mitigation projects	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. Ex. CERT Teams, Red Cross, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural disaster or safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Other (if any)	

Overall Capability	Limited/Moderate/High
Financial resources to implement mitigation projects	Limited
Staff/expertise to implement projects	Limited
Public support to implement projects	Limited
Time to devote to hazard mitigation	Limited

Plan Integration

McPherson County has several planning documents that discuss or relate to hazard mitigation. Each plan is listed below along with a short description of how it is integrated with the hazard mitigation plan. In addition, the county has a 1999 comprehensive plan, a 2008 zoning ordinance, and 2008 subdivision regulations. Due to the age of these plans, they have not been integrated with the hazard mitigation plan. The county has discussed plans to update the comprehensive plan in the next several years. No other planning documents were identified during this process. The county will seek out and evaluate any opportunities to integrate the results of the current hazard mitigation plan into other planning mechanisms and updates.

Building Code

The building code sets standards for constructed buildings and structures. The county has adopted the State of Nebraska building code with no amendments.

McPherson County Local Emergency Operations Plan (2017)

The local emergency operations plan establishes standardized policies, plans, guidelines, and procedures for emergency resources and governmental entities to respond and recover when a disaster event occurs. It contains information regarding direction and control, communications and warning, damage assessment, emergency public information, evacuation, fire services, health and human services, law enforcement, mass care, protective shelters, and resource management. This plan is updated every five years.

Western Sandhills Community Wildfire Protection Plan (2019)

The purpose of the Western Sandhills Community Wildfire Protection Plan (CWPP) is to help effectively manage wildfires and increase collaboration and communication among organizations who manage fire. The CWPP discusses county-specific historical wildfire occurrences and impacts, identifies areas most at risk from wildfires, discusses protection capabilities, and identifies wildfire mitigation strategies. This document is updated every five years.

Historical Occurrences

The following table provides a statistical summary for hazards that have occurred in the county. The property damages from the NCEI Storm Events Database (January 1996 – December 2019) should be considered only as broad estimates. Crop damages reports come from the USDA Risk Management Agency (RMA) for McPherson County between 2000 and 2019.

Table MPH.11: County Hazard Loss History

Hazard Type		Count	Property Damage	Crop Damage ²
Agricultural Disease	Animal Disease ¹	2	2 animals	N/A
	Plant Disease ²	0	N/A	\$0
Chemical Spills – Fixed Site ³		0	N/A	N/A
Chemical Spills – Transportation ⁴		0	\$0	N/A
Dam Failure ⁵		0	N/A	N/A
Drought ^{6,8}		434 months in drought out of 1,498	\$1,000,000	\$90,822
Earthquakes ¹¹		0	N/A	N/A
Extreme Heat ⁷		Average: 3 days/year	N/A	\$279,452
Flooding ⁸	Flash Flood	0	\$0	\$0
	Flood	1	\$75,000	\$0
Grass/Wildfires ¹²		64	3,582 acres	\$2,520
Hail ⁸ Range(in): 0.75-3.5 Average(in): 1.14		170	\$98,000	\$1,718,701
High Winds ⁸ Range(mph): 40-71 Average(mph): 57.5 1 injury		21	\$12,000.00	\$84,469.00
Levee Failure ¹⁰		0	N/A	N/A
Public Health Emergency		Undefined	N/A	N/A

Hazard Type		Count	Property Damage	Crop Damage ²
Severe Thunderstorms⁸	Thunderstorm Wind Range(mph): 57.5-80.5 Average(mph): 63	27	\$26,000	\$90,919
	Heavy Rain	1	\$0	
	Lightning	1	\$0	
	Severe Winter Storms⁸			
	Blizzard	7	\$30,000	
	Extreme Cold/Wind chill	6	\$0	
	Heavy Snow	7	\$5,000	\$22,132.00
	Ice Storm	0	\$0	
	Winter Storm	39	\$0	
	Winter Weather	0	\$0	
	Terrorism⁹	0	\$0	N/A
	Tornadoes⁸ Range: EF0-EF1 Average: EF0	10	\$213,000	\$0
Total		356	\$1,459,000	\$2,289,015

N/A: Data not available
 1 - NDA, 2014 – November 2020
 2 - USDA RMA, 2000 – 2019
 3 - NRC, 1990 – February 2020
 4 - PHSMA, 1971 – July 2020
 5 – NeDNR Correspondence
 6 - NOAA, 1895 – October 2019

7 - NOAA, 1893 – July 2020
 8 - NCEI, 1996 - December 2019
 9 - University of Maryland, 1970-2018
 10 – USACE NLN, 1900 – July 2020
 11 – USGS, 1900 – July 2020
 12 – NFS 2000 – 2017

The following table provides a summary of hazards that have affected or have the potential to affect each participating jurisdiction in McPherson County. Each jurisdiction was evaluated for previous hazard occurrence and the probability of future hazard events on each of the 17 hazards profiled in this plan. The evaluation process was based on data collected and summarized in Table MPH.11; previous impacts or the potential for impacts to infrastructure, critical facilities, people, and the economy; and the proximity to certain hazards such as dams and levees. For example, while there have not been instances of dam failure in the county, there exists a possibility for a dam to fail in the future due to the presence of one dam in the county.

Table MPH.12: McPherson County and Community Hazard Matrix

Hazard	McPherson County
Ag. Disease	X
Chemical Spills (Fixed Site)	X
Chemical Spills (Transportation)	X
Dam Failure	X
Drought	X
Earthquakes	X
Extreme Heat	X
Flooding	X
Grass/Wildfires	X
Hail	X
High Winds	X
Levee Failure	
Public Health Emergency	X
Severe Thunderstorms	X
Severe Winter Storms	X

Hazard	McPherson County
Terrorism	X
Tornadoes	X

County Hazard Prioritization

The hazards discussed in detail below were either identified in the previous HMP and determined to still be of top concern or were selected by the local planning team from the regional list as relevant hazards for the county. The planning team prioritized the selected hazards based on historical hazard occurrences, potential impacts, and the county’s capabilities. For more information regarding regional hazards, please see *Section Four: Risk Assessment*.

Drought

Drought can lead to a loss of crops and livestock, as well as increase the risk of wildfire. It has also led to population loss in the past as the area is heavily reliant on the agricultural sector. The local planning team estimates that drought occurs every five to 10 years in the county. The water supply has been deemed sufficient for county needs. There is no Public Works Department in the county as the entire population is supplied by private wells. Due to the private wells that residents use, the county does not have the ability to implement water control measures and does not have a drought plan in place.

Flooding

Although not identified as a top hazard of concern by the local planning team, HAZUS indicated that there are floodplain areas in the county. NCEI data since 1996 show that the county has experienced one flooding event. Damages from the event totaled \$75,000. Figure MPH.5 shows the location of the HAZUS indicated floodplain areas.

Grass/Wildfire

The local concerns regarding this hazard centers on property loss and safety of firefighters. The largest reported fire occurred in April 2006 when a wildfire burned 1,000 acres of rangeland. Grass/wildfires often occur several times a year in the county, depending on rainfall and other conditions. Potential impacts include loss of grazing land, structural damage, and danger to people and livestock. The county has one fire district which covers the entire county. In addition, the county has mutual aid agreements with surrounding fire districts.

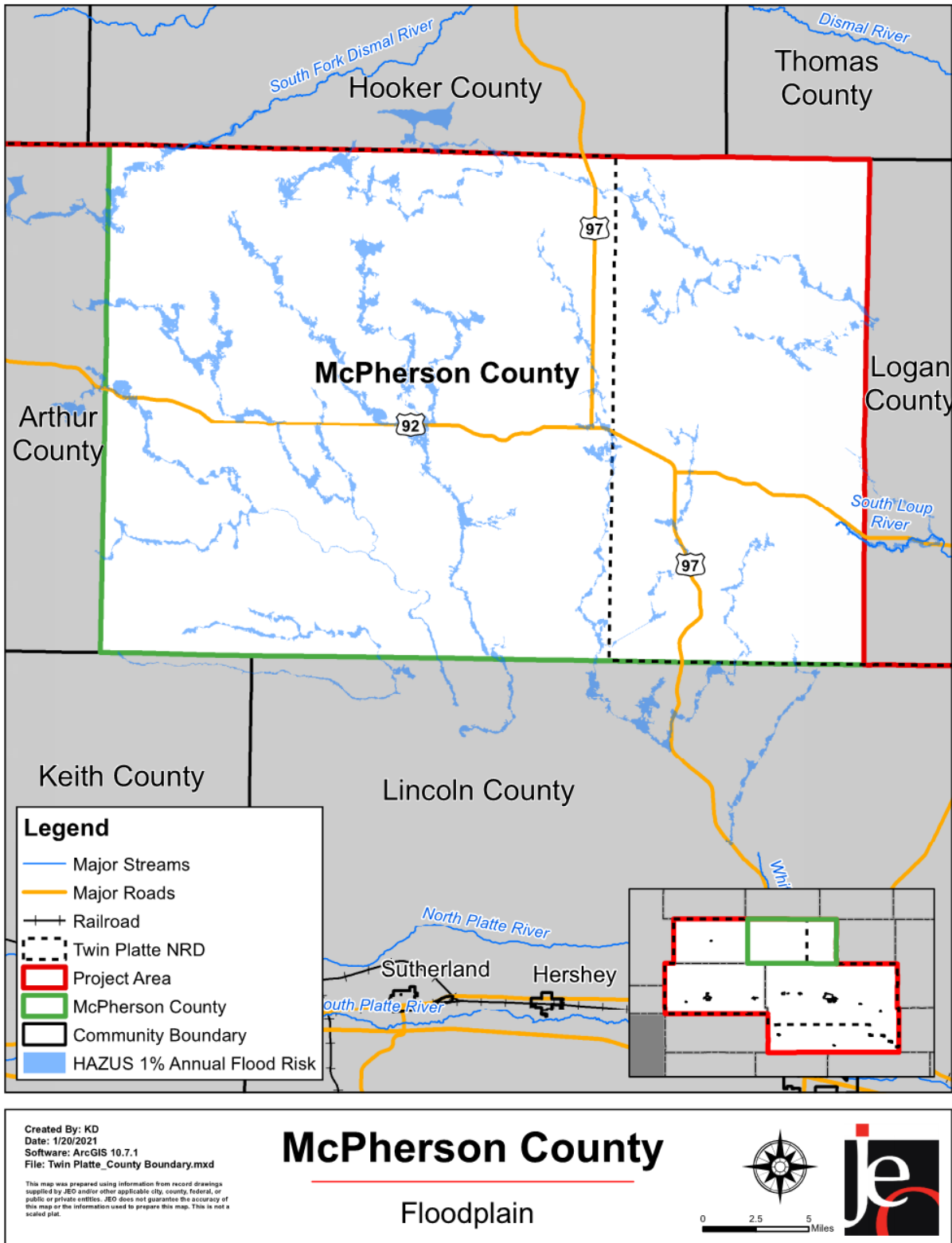
Severe Thunderstorms

Severe thunderstorms are a regular part of the climate in McPherson County and the rest of the planning area. NCEI reported 29 severe thunderstorms since 1996 resulting in \$26,000 in damages. The local planning team is concerned that severe thunderstorms will lead to other hazards such as rapid rain fall and large hail. Recent thunderstorms have resulted in a grassfire from lightning as well as road and structural building damage from significant water flows.

Severe Winter Storms

Severe winter storms are a regular part of the local climate and occur every four to five years, with the potential to occur every winter. The local concerns regarding this hazard include damage to powerlines, loss of transportation routes, and inability to reach vulnerable populations during an emergency. Other impacts include damage to structure and loss of livestock. Severe winter storms have caused structural damage to critical facilities in the past. For example, the roof on the school caved in after a winter storm in 1949. In the future the county would like to set up and supply an emergency shelter facility.

Figure MPH.5: Floodplain Map



Note: There is no DFIRM for the county. Floodplain was generated using the HAZUS program.

Tornadoes

Tornadoes can devastate a community, causing loss of life, property, crops, and livestock. NCEI reports that 10 tornadoes have occurred and caused \$213,000 in property damages. The most recent occurrence was in June 2018 when an EF1 tornado caused \$60,000 in damages to rural homes and an irrigation pivot. The local planning team indicated that a tornado destroyed the courthouse in 2003. There are no storm shelters in the county. Storm spotters are used and receive annual training. Tryon has an alert siren but rural areas in the county do not.

Mitigation Strategy

McPherson County's funds are limited to maintaining current facilities and systems and have remained stable over recent years. Even with a large portion of funds not yet dedicated to a specific project, the county will likely need grant assistance to help pay for many of the mitigation actions listed below. The county has experience applying for grants and has been awarded a remote siren controller grant in the past.

Completed Mitigation Actions

Mitigation Action	Improve Warning Systems
Description	Evaluate current warning systems and develop new warning system where necessary. Obtain and upgrade warning system equipment and methods, including alert sirens. Identify locations for weather warning radios and improve or upgrade radios.
Hazard(s) Addressed	All Hazards
Status	Completed: Remote activation was added to the community siren

Continued Mitigation Actions

Mitigation Action	Backup and Emergency Generators
Description	Identify and evaluate current backup and emergency generators. Obtain additional generators based on identification and evaluation.
Hazard(s) Addressed	Tornadoes, High Winds, Severe Winter Storms, Severe Thunderstorms, Flooding
Estimated Cost	\$20,000 - \$50,000 per generator
Funding	County General Fund, Private entities
Timeline	2-5 Years
Priority	Medium
Lead Agency	Emergency Manager, County Board
Status	Not Started

Mitigation Action	Reduce Flow Restrictions
Description	Evaluate restrictions and measures to prevent or reduce damage from flooding. Implement appropriate nonstructural or structural methods on an emergency or permanent basis (such as monitoring, ice jam dusting, or other flow improvements).
Hazard(s) Addressed	Flooding
Estimated Cost	\$10,000 - \$50,000 for studies; \$10,000 - \$100,000+ for infrastructure and structural improvements
Funding	Property Taxes
Timeline	Ongoing
Priority	Medium
Lead Agency	County Road Department
Status	In Progress: Drainage culverts and roadbed improvements are currently underway

Mitigation Action	Update Comprehensive Plan
Description	Update comprehensive plan and integrate plan with Hazard Mitigation Plan components.
Hazard(s) Addressed	All Hazards
Estimated Cost	\$10,000
Funding	County General Fund
Timeline	1 Year
Priority	Medium
Lead Agency	County Board
Status	Not Started

Removed Mitigation Actions

Mitigation Action	Purchase Snowplow
Hazard(s) Addressed	Severe Winter Storms
Reason for Removal	The county is no longer in need of an additional snowplow.