

City of Greene, Iowa

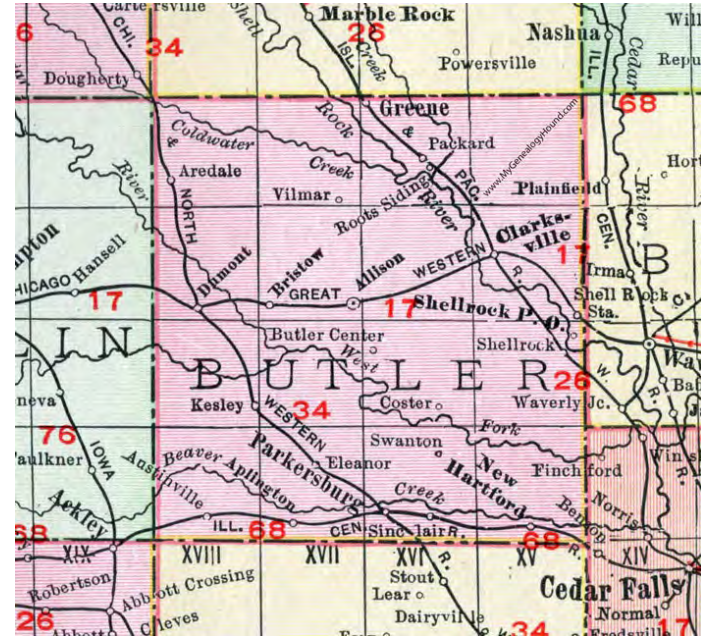
Hazard Mitigation Plan 2025 Update

Appendix G of Butler County Multi-Jurisdictional Hazard Mitigation Plan

Funded by the Butler County Emergency
Management Agency

Prepared by Iowa Northland Regional Council
of Governments (INRCOG)

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INRCOG
Iowa Northland Regional
Council of Governments

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2025 Greene Hazard Mitigation Plan

Resolution Adopting Plan by City Council

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2025 Greene Hazard Mitigation Plan

About

The City of Greene developed this Plan as part of the 2020 Butler County Multi-Jurisdictional Hazard Mitigation Plan update process. The 2025 Butler County Multi-Jurisdictional Hazard Mitigation Plan is a sequential 5-year update to the previous document. Federal regulations regarding how local governments may receive funding from FEMA require that the specified jurisdiction (city, school district, county) have an approved hazard mitigation plan that is in good standing (updated and FEMA approved) to remain eligible for grant funding. This Plan was developed to meet the requirements in Title 44 CFR § 201.6.

Elected officials, city clerks, planners, first responders, and other stakeholders were invited to attend planning committee meetings as participants to learn about hazard mitigation and complete data gathering assignments. These assignments were submitted to the plan development coordinators: Butler County Emergency Management Agency (EMA) and Iowa Northland Regional Council of Government (INRCOG). Butler County's EMA initiated and funded this effort for all participating communities and contracted INRCOG to coordinate the plan development process with a multi-jurisdictional approach.

Participating communities included all ten (10) incorporated municipalities of Butler County. County staff participating in the committee were representing their respective County departments. School district superintendents for the public school districts attended and completed the data gathering assignments for their district communities. Four (4) committee

FEMA's Emergency Management Cycle



What is Hazard Mitigation?

Hazard Mitigation is any *sustained* action taken to reduce or eliminate long-term risk to life and property from hazards.

The emergency management cycle has 4 phases:

- **Preparedness** is the assessment of potential risks, hazards, and vulnerabilities that a community may face. The development and updating of activities, programs, and systems before an event occurs is included in this phase of the cycle.
- **Response** is the immediate effects after a disaster.
- **Recovery** is a long-term phase that focuses on returning the community to normal after a disaster.
- **Mitigation** is an action that can occur at any phase.

meetings were held between October 1st and December 12th wherein each participant provided data and completed work sheets to develop their hazard mitigation plans.

The Benefits of Hazard Mitigation for Local Governments

For local governments, there are benefits in knowing how specific hazards may affect their communities, its potential to cause negative impacts, and develop pre-disaster actions or activities to lessen or avoid those anticipated negative impacts. Benefits include:

- ✓ An increased understanding of how natural and human caused hazards develop under certain conditions which may inform a level of magnitude or intensity.
- ✓ Take advantage of the opportunity to create more sustainable and disaster-resistant communities.
- ✓ Participating in this collaborative intergovernmental effort is cost effective for all participants.
- ✓ Using limited resources to address the threat from hazard events that may have the biggest impact on the community.
- ✓ Reducing or preventing damage to existing structures and reducing their subsequent repair costs.
- ✓ Identifying vulnerable populations to establish equitable outcomes.

- ✓ Hazard mitigation involves a commitment to long-term goals that focus on lessening or reducing negative impacts of natural, and human caused hazards.

The Planning Process

In order to reduce the threat of negative impacts from natural hazards, a risk informed approach was used in this planning process. A risk informed approach is a multi-step process. This Plan also involves collaboration among participants in the planning committee. The process involved learning the historical occurrence of when such hazards may have occurred in Butler County.

Participants in the Butler County Multi-Jurisdictional Hazard Mitigation Plan Planning Committee determined the level of risk facing their communities by completing a risk assessment. Data gathering by committee participants involved giving updates to existing mitigation activities by the local government.

Participants in the Plan followed a general 5 step process. (below)



Community Data Sources

Population data is based on 2020 decennial Census data. The 2022 American Community Survey 5-year estimates are the latest and most reliable survey data sets to understand what is taking place in the county and each city. Most counties, cities, and towns rely on 5-year estimates. Employment, workforce, and industry figures in this Plan are estimates that have a margin of error.

It is important to note that the ACS estimates used for rural communities will have a degree of uncertainty associated with them, called sampling error, because they are based on a sample. In general, the larger the sample, the smaller the level of sampling error. Rural communities tend to have smaller samples than larger cities, so the “margin of error”—a measure of the precision of an estimate at a given level of confidence—likely will be larger for rural areas.

Crash data along roadways within each jurisdiction is collected between the period of 2019 and 2023. Using a map tool interface, the data was taken at a city level and presented to understand incident severity, casualties, and property damage from reported accidents. Accident data is added to the site daily and accessible through an online website, <https://icat.iowadot.gov/>.

In the risk analysis section of this Plan, estimates of property loss are measured using mapping of hazardous zones. For the vulnerability risk assessment, flood prone homes were determined using the boundaries of the 100 year (1%) annual chance flood zone. The value of potential property loss was derived from the 2023 assessed dollar value of

structures and dwellings on affected parcels provided by the Butler County Assessor’s Office.



Butler County Freedom Rock located in Greene, Iowa

City Profile

Jurisdiction: City of Greene

County: Butler County

Population (2020): 990

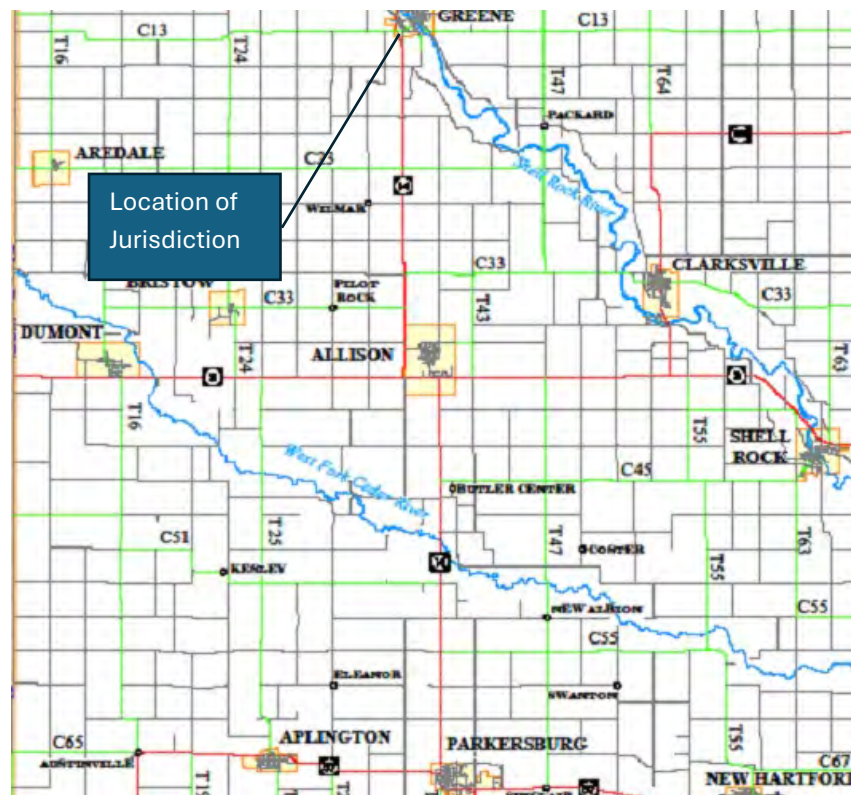
The City of Greene is in the north of Butler County. State Highway 14 runs north and south of the city.

The following data presented in tables on the following page include population, employment, and industry sector data for the community based on 2020 Census data and 2022 American Community Survey 5-year Estimates.

In 2020, the city's population was 990 and 98.0% were White with the median age is 49.3. Working aged residents (15-60 years) made up 46.2% of the population. Children and teens (younger than 15 years) made up 13.9% of Greene's population while older adults (older than 60 years) made up 39.9%.

The median household income in 2022 was \$51,756. The unemployment rate was 3.0%. Most people commute to work, and 22 people, or 3.7% of the workforce, work from home. The top three largest industry sectors in Greene are as follows (in order from highest to lowest): 1) Educational services, and health care, and social assistance, 2) Manufacturing, and 3) Wholesale Trade.

Figure 1: Map of Butler County



2025 Greene Hazard Mitigation Plan

Table 1: Population Data (2020)		
City of Greene		
	Total	% of Population
Total population	1,267	100%
AGE		
Under 5 years	56	4.4%
5 to 9 years	28	2.2%
10 to 14 years	97	7.3%
15 to 19 years	77	6.1%
20 to 24 years	59	4.7%
25 to 29 years	104	8.2%
30 to 34 years	88	6.9%
35 to 39 years	47	3.7%
40 to 44 years	39	3.1%
45 to 49 years	54	4.3%
50 to 54 years	57	4.5%
55 to 59 years	60	4.7%
60 to 64 years	117	9.2%
65 to 69 years	95	7.5%
70 to 74 years	62	4.9%
75 to 79 years	35	2.8%
80 to 84 years	76	6.0%
85 years and over	121	9.6%
Median Age	49.3	-
RACE		
White	1,179	93.1%
Black or African American	6	0.5%
Hispanic or Latino (of any race)	28	2.2%
American Indian and Alaska Native	4	0.3%
Asian	74	5.8%
Native Hawaiian/Other Pacific Islander	0	0.0%
Some Other Race	28	2.2%
Two or More Races	24	1.9%

Source: 2022 ACS 5-Yr Estimates

Table 2: Employment Data (2022)		
City of Greene		
	Value	% of Population
Median Household Income	\$51,756	-
Unemployment Rate (2022)	3.0%	-
Workers that commute to work	572	96.3%
Workforce that works from home	22	3.7%

Source: 2022 American Community Survey 5-Yr Estimates

Table 3: Employment Industry Data (2022)		
City of Greene		
Workforce Industry	# of Workers	% of Workforce
Workforce	609	100%
Agriculture, forestry, fishing and hunting, and mining	11	1.8%
Construction	23	3.8%
Manufacturing	98	16.1%
Wholesale trade	36	5.9%
Retail trade	34	5.6%
Transportation -warehousing, utilities	29	4.8%
Information	2	0.3%
Finance and insurance, and real estate and rental and leasing	35	5.7%
Professional, scientific, and management, and administrative and waste management services	15	2.5%
Educational services, and health care and social assistance	265	43.5%
Arts, entertainment, and recreation, and accommodation and food services	20	3.3%
Other services, except public administration	20	3.3%
Public administration	21	3.44%

Source: 2022 American Community Survey 5-Yr Estimates

Highway Traffic and Crash Data

Based on Iowa DOT crash data, between 2019 and 2024 there have been 13 incidents. Of those incidents, 8 incidents were property damage only, resulting in \$174,050 in total damages. No fatalities and 1 crashes with severely injured persons were reported.

Table 4: Crash Data from 2019-2024	
Total Crashes	13
Crash Severity	
Fatal	0
Suspected Serious Injury	1
Suspected Minor Injury	1
Unknown	3
Property Damage Only	8
Property Damage Total	\$174,050
<i>Source: Iowa DOT Crash Data</i>	

Figure 2: Iowa Crash Analysis for All Traffic Incidents (2019-2024)



Source: Iowa DOT

Housing Data

The City of Greene has 587 occupied housing units. Nearly 87% of them are single family detached housing. There are 4 housing units that are mobile homes or other types of housing. There are 39 duplex apartments. 11.7% are multifamily (greater than 2 units).

A large portion of the housing stock was built between 1940-59 (28.3%). About 90.9% of the housing stock was built prior to 1980. Most homes heat their units with gas (87.1%).

Community Utility Providers

Alliant Energy provides utility electric services and Black Hills Energy provides natural gas services. Omnitel and Windstream provide telephone services and internet services. Residents receive water and sewer from the city while Jedro Sanitation provides Sanitation.

Table 6: Utility Providers	
City of Greene	
Electric	Alliant Energy
Natural Gas	Black Hills Energy
Telephone/Internet	Omnitel and Windstream
Cable TV	Omnitel and Windstream
Water Services	City of Greene
Sewer Services	City of Greene
Sanitation	Jedro Sanitation

Table 5: Housing Data (2022)		
City of Greene		
	Total	% of Occupied Units
Occupied housing units	587	100%
Housing Unit Type		
1, detached	506	86.2%
1, attached	8	1.4%
2 apartments	39	6.6%
3 or more apartments	30	5.1%
Mobile home or other type of housing	4	0.7%
Year Structure Built		
2020 or later	0	0%
2010 to 2019	8	1.4%
2000 to 2009	46	7.8%
1980 to 1999	75	12.8%
1960 to 1979	86	14.7%
1940 to 1959	166	28.3%
1939 or earlier	206	35.1%
House Heating Fuel		
Utility gas	511	87.1%
Bottled, tank, or LP gas	3	0.5%
Electricity	73	12.4%
Fuel oil, kerosene, etc.	0	0%
Coal or coke	0	0%
All other fuels	0	0%
No fuel used	0	0%

Source: 2022 American Community Survey 5-Year Estimates

Vulnerable Assets

People

Vulnerability to hazard losses increase when there are larger concentrations of people. In towns where population density increases, the number of people that can be harmed during a hazard event (tornado, flood, etc.) increases. In addition, there are segments of the population that may be more susceptible to impacts and/or harm from a hazard depending on their location within the area (i.e. flood zone or near industrial plants with hazardous materials). This includes underserved or socially vulnerable populations.

Vulnerable Age Groups

Both younger and older age groups are likely to require assistance with physically moving to shelters or finding safety. Elderly residents may not have a personal vehicle to move away from a hazard quickly. Cognitive impairments among older adults may cause some to get easily confused.

Households Facing Poverty or With Limited Income

Families or older adults living near or below poverty are more likely to be impacted by hazards than other households with higher incomes. The costly repairs from a tornado or derecho for a low-income household may be more adversely affected than another household that has the same damage but may be able to afford the repairs without much change to their lifestyles or needs. That disparity is also different during extreme weather events such as heat waves. Low-income households may not be able to afford the electricity to run air conditioning and many may face

complications that involve heat stroke, fatigue, or death due to their age (infants or the infirm) and health conditions (obesity, heart conditions, diabetes).

Greene Vulnerable Populations

In Greene, 15.9% (or 197 out of 1,237) of individuals are below the poverty level. About 43.3% (254) of occupied households have elderly occupants (65 years and over). About 12.8% of occupied households have elderly residents (65 years and over) living alone.

Most residents have access to a vehicle, however an estimate of 7.7% (45) households have no access to a vehicle. Nearly 13% of households have a person living with a disability. This is broadly defined from the data estimates for Greene. However, persons with mobility disabilities may be at a higher risk than others especially during unexpected natural disasters where accessibility is not always guaranteed to shelter.

Manufactured homes are unsafe in a tornado. Fatality rates are significantly higher than sturdy buildings. An alternative shelter should be identified prior to a tornado watch or warning. In 2022, there are about 4 mobile homes estimated in Greene.

Greene has about 25 individuals living in group quarters, all of which is nursing facilities/skilled-nursing facilities.

Critical Facilities

Water Supply

The City of Greene, Iowa, operates a municipal water supply system serving approximately 1,130 residents. The system sources water from two active wells, known as Greene #1 and Greene #2, both drawing from the Devonian aquifer at depths of approximately 240 and 225 feet, respectively. Water is treated with chlorine at the well sites to ensure quality and safety.

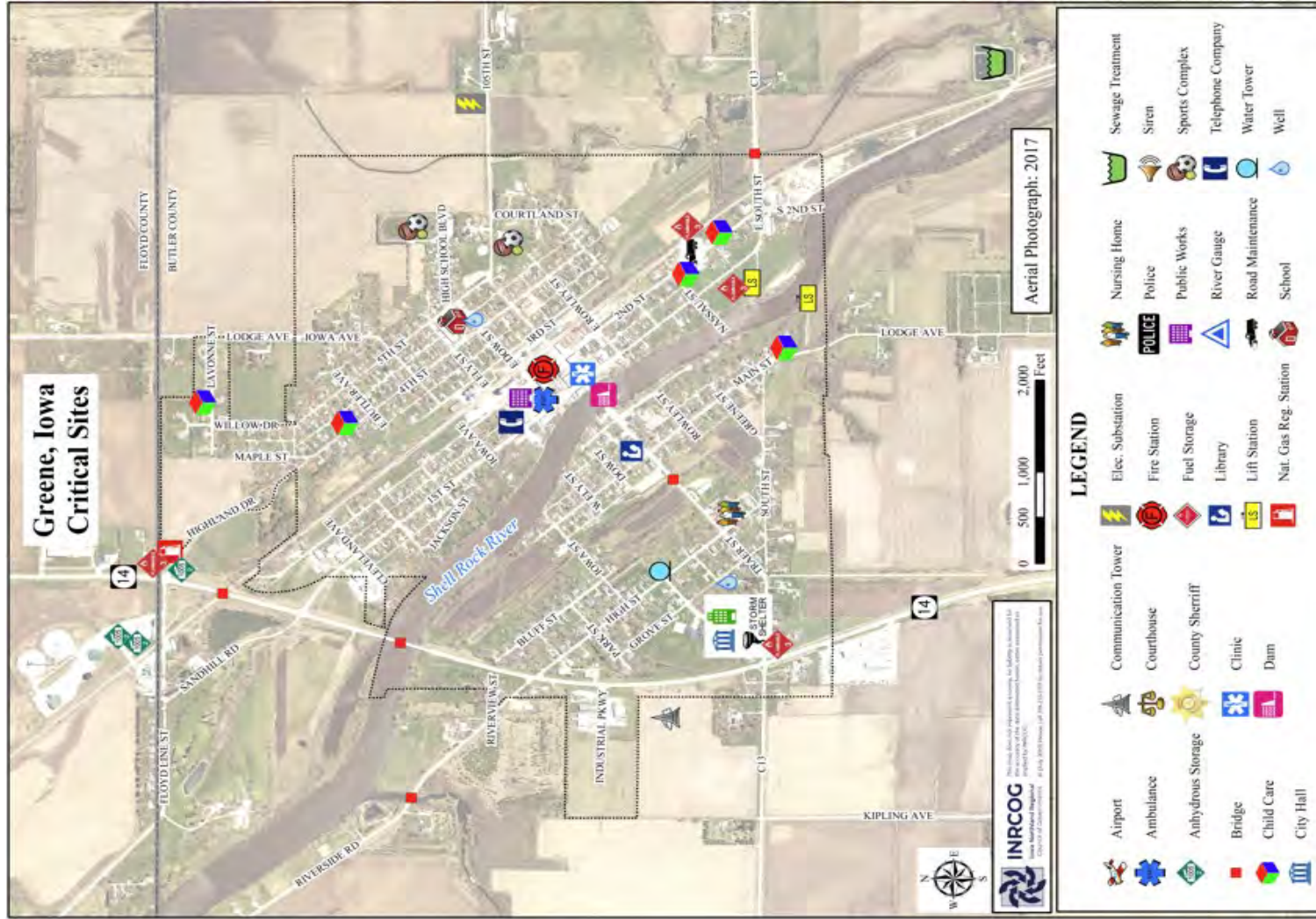
The city maintains an elevated water tower with a capacity of 300,000 gallons to support consistent water pressure and supply. While specific data on daily water usage isn't readily available, the system is designed to meet the community's needs effectively. Additionally, some housing units in Greene rely on individually drilled wells for their water needs.

Wastewater Treatment Plant and Lift Stations

The City of Greene operates a wastewater treatment facility that processes municipal wastewater collected through an extensive network of sewer lines and lift stations. The treatment system utilizes a lagoon-based process, effectively meeting the community's wastewater management needs. Constructed in the early 1980s, the facility has been consistently maintained and periodically upgraded to comply with environmental standards and to support both current residents and future economic development.

Greene regularly evaluates its wastewater infrastructure to ensure long-term efficiency and compliance with regulatory requirements. Projections indicate that over the next 20 years, the city's population will remain steady. The existing wastewater treatment facility has sufficient capacity to accommodate gradual growth. Future hazard mitigation efforts will incorporate considerations for additional facilities and improvements identified through vulnerability assessments.

Figure 3: Critical Facilities



Measuring Vulnerability to Selected Hazards

Tornado Hazard

Although there is no recent history of tornadoes in Greene, the City remains vulnerable.

All buildings in Greene are prone to being damaged by a tornado. Therefore, the vulnerability of the community was determined by the assessed valuation of all buildings and dwellings on all parcels within the city’s limits.

Using the assessed value from December 2023, the valuation of all 893 parcels in the City of Greene is \$67,247,540 based on Butler County assessor data. The City of Greene has a potential property loss of \$58,325,820 from a tornado disaster.

Table 7: Valuation of All Parcels in City of Greene (2023)	
Percent of City at Risk of a Tornado	100%
# of Parcels	893
Total Assessed Value of Buildings and Dwellings on Affected Parcels in 2023	\$58,325,820
Source: Butler County Assessor’s Office	

Flood Prone Areas

The potential property losses of structures prone to flooding was calculated using the effective flood insurance rate map (FIRM) flood hazard zones for a 100-year (1%) annual chance flood.

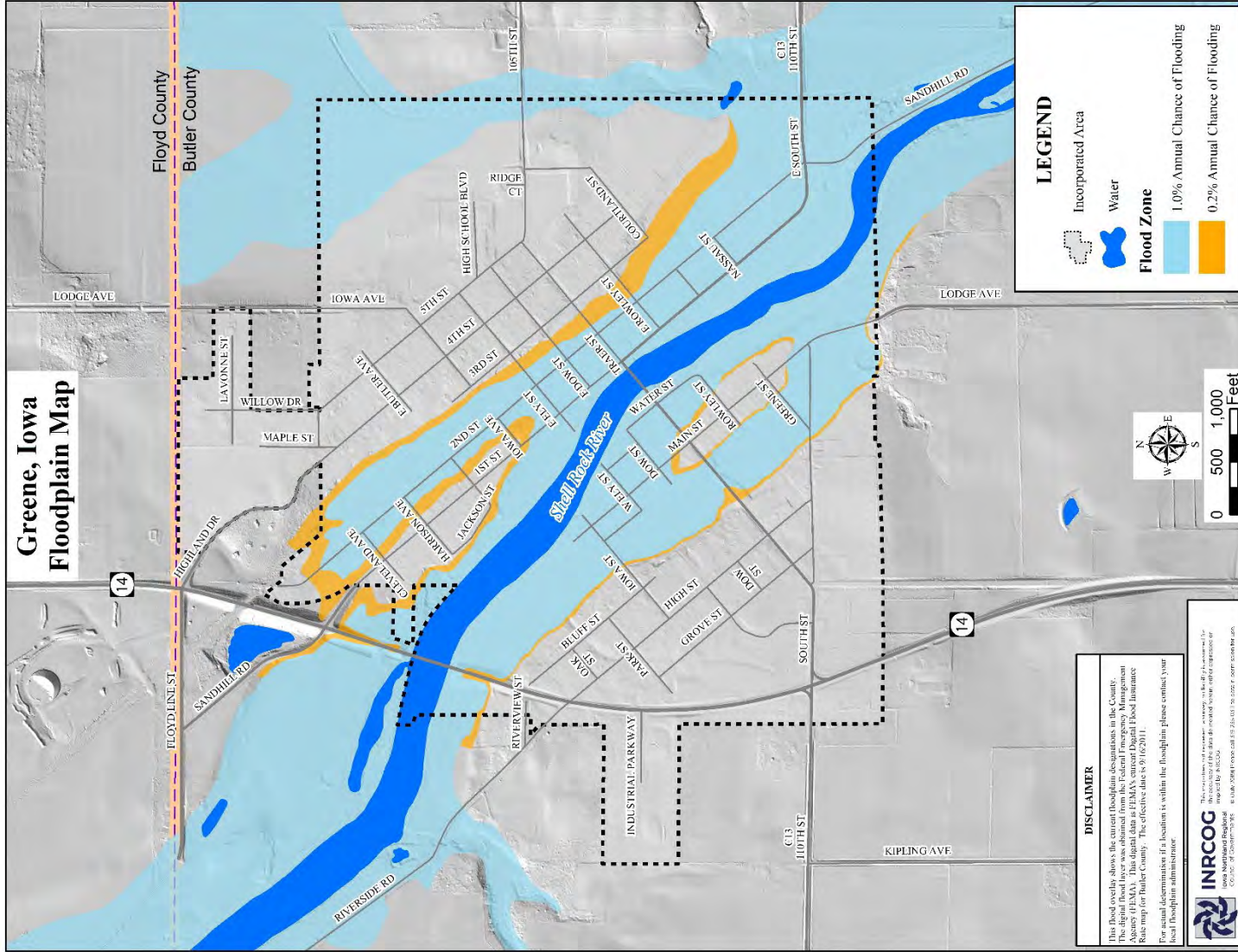
Assessing the community’s vulnerability to losses from tornado and flood hazards is determined with county assessor data. The potential property losses of structures prone to flooding was calculated using the effective flood insurance rate map (FIRM) flood hazard zones for a 100-year (1%) annual chance flood.

In Figures 4 and 5, the flood plain map shows the 1% annual chance of flooding in and around the City of Greene. The river basin is depicted in the topography shown on the map.

The parcels that are impacted by the 1% annual chance of flood are highlighted in Figure 6. There are 158 parcels within Greene that are potentially affected. The value of all buildings and dwellings on the affected parcels is \$6,459,160 based on the latest Butler County assessor information. This covers 11.67% of the city’s total parcels.

Table 8: Potential Property Losses from the 1% Annual Chance Flood	
Percent of City Affected	11.67%
# of Parcels	158
Total Assessed Value of Buildings and Dwellings on Affected Parcels in 2023	\$6,459,160
Source: Butler County Assessor’s Office	

Figure 4: Flood Plain Map



Future Development

Recent updates in Title 44 CFR §201.6 (c) (2) (i) require this risk assessment include a section with future conditions on the type, location, and range of anticipated intensities of natural hazards.

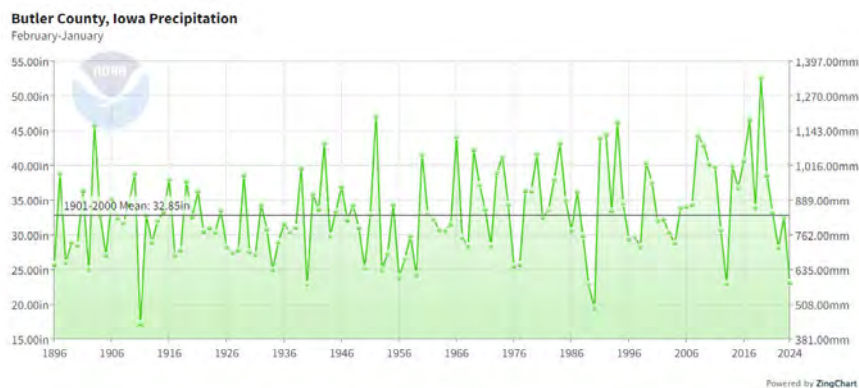
Long term trends of climate patterns for the region were summarized in the Fourth National Climate Assessment Midwest Section.¹ The National Climate Report is mandated to be updated every 4 years and deliver results to Congress and President on the effects to agriculture, energy productions, land use, transportation, and human health.

Yearly precipitation levels and annual average temperatures offer insights into future conditions of our climate system.

Annual Precipitation Levels in Butler County

Taking the monthly precipitation records from January to December between 1895 and 2024 is shown in Figure 6. The values hover between 20 - 50 inches of precipitation levels recorded. The average precipitation level for the year is plotted and a linear trend of those values is shown in Figure 6. The trend shows a growing level of annual precipitation on average of 32.80 inches. Based on this historical trend, precipitation is likely to continue to increase in the coming years.

Figure 6: Historical Precipitation Data and Trend for Butler County, Iowa²



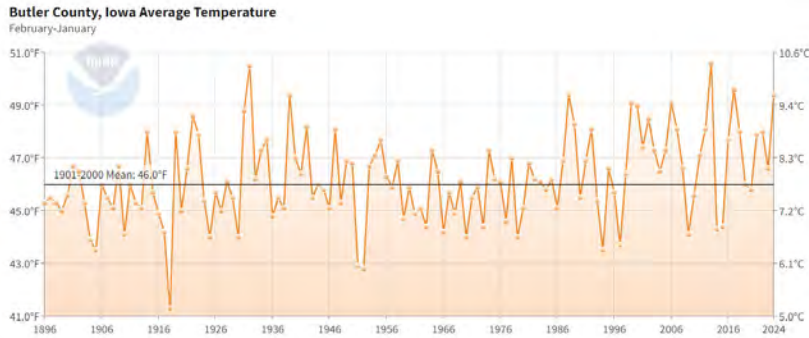
Average Annual Temperatures in Butler County

The monthly average temperature is plotted over a 12-month period from 1885 to 2023 in Figure 7. The annual average temperature is also shown with a linear trend in Figure 7. This trend shows the average temperature in Butler County increasing at a rate of +0.1° F every 10 years.

¹ USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

² NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published February 2024, retrieved on April 15, 2024 from <https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series>

Figure 7: Historical Temperature Data and Trend for Butler County, Iowa²



Climate Patterns from Increasing Precipitation and Higher Temperatures

Drought

The relationship between increasing precipitation, temperature, and drought is complex, and often counterintuitive at first thinking about it. While increasing precipitation may seem like it would mitigate drought conditions, higher temperatures can exacerbate the situation in several ways:

1. **Evapotranspiration:** Higher temperatures lead to increased evaporation rates from soil, bodies of water, and plants. This means that even if there is more precipitation, it may quickly evaporate before it can effectively replenish soil moisture or water sources.
2. **Changes in precipitation patterns:** Increasing temperatures can alter precipitation patterns, leading to more intense rainfall events but also longer

periods of drought between these events. This pattern can result in rapid runoff and soil erosion during heavy rain, followed by extended dry periods that contribute to drought conditions.

Overall, while increasing precipitation may provide temporary relief from drought, the combined effects of rising temperatures can outweigh this benefit, leading to more frequent and severe drought events in certain regions.

Pest Infestation

With more humidity, the daily minimum temperature may increase across all seasons. Warming winters can increase the survival and reproduction of existing insect pests which allow new insect pests and crop pathogens to move into the Midwest region.

Extreme Heat Domes

A heat dome is a weather phenomenon characterized by a high-pressure system that traps hot air beneath it, leading to prolonged periods of extremely high temperatures and often causing heatwaves. Extreme heat events during the summers may occur more frequently in the Midwest.

The human impacts of extreme heat affect socially and economically vulnerable populations the most. The higher costs of energy during heat waves disproportionately impact cost-burdened households. Heat related illness may be more severe among infants, elderly populations, and those with chronic health conditions.

Projected Trends of Natural Hazards in Butler County

- Prologued drought may occur as the atmosphere holds more moisture (even pulling moisture from plants) as the temperature increases. Longer periods between weather events mean there are drier and longer periods in between these events.
- Floods (flash or major types) will increase in intensity as the atmosphere holds more moisture to drive stronger storms and drop heavier rainfall over a shorter period during an event.
- Extreme heat may occur more frequently. Human health impacts are higher among socially vulnerable populations (the elderly, infants, those with chronic health issues, cost burdened households).
- Agricultural pests and pathogens may increase in growing plants and stored grain. Warming temperatures in the spring and summer have led to rising humidity. Higher dew and moisture conditions may increase the presence of these pests or crop diseases.

National Flood Insurance Program

The City of Greene, Iowa, actively participates in the National Flood Insurance Program (NFIP) to mitigate the impacts of flooding on residents and property. Greene has experienced repetitive loss properties, which are defined as those incurring two or more flood insurance claims exceeding \$1,000 within a 10-year period. These properties underscore the city's vulnerability to flooding due to its proximity to the Shell Rock River. Efforts to address these repetitive loss properties have included floodplain management strategies, enforcement of building codes, and participation in hazard mitigation initiatives. The city aims to reduce flood risks, protect property values, and enhance community resilience through these ongoing efforts.

Hazard Risk Assessment

The top three hazards from the risk assessment are:

1. Severe Winter Storms
2. River Flood
3. River Flood



Methodology

This risk assessment identifies how people, property, and structures would be harmed or damaged by one of the listed hazard events. Iowa Homeland Security and Emergency Management Department (Iowa H.E.S.M.D.) provided the hazard risk score formula for determining the level of risk used in this analysis.

Factors of Hazard Risk

Risks to a hazard may differ across geographical locations or even differ based on certain times of year. For example, tornado season in Iowa is usually in May and tornados have the highest risk during this time due to change in weather patterns from the western and central Gulf of Mexico causing higher chances of extreme weather.

For this analysis, four hazard risk factors are rated on a scale between 1 and 4 by committee participants after reviewing

profiles of each hazard with the planning coordinator. Information was shared with the committee which described the hazard, historical occurrences, impact, duration, and warning time. Participants used this information to strengthen their understanding to rate each hazard factor.

Hazard Risk Score Formula

$$\begin{aligned}
 &[\text{Probability}] \times 45\% + [\text{Magnitude or Severity}] \times 30\% \\
 &+ [\text{Warning Time}] \times 15\% + [\text{Duration}] \times 10\% \\
 &= \text{Final Hazard Assessment}
 \end{aligned}$$

Source: Provided by Iowa H.S.E.M.D.

Hazard scores were collected during the 2nd county committee meeting. INRCOG planners calculated the hazard risk score for each hazard based on the formula in this section. Results for Greene are located below.

Score Value vs. Hazard Risk Level	Description of hazard with this rating
Scores with a value closer to 1: <u>Low risk hazard</u>	Hazard is not likely to affect people or property because the likelihood is minimal.
Scores with a value closer to 4: <u>High risk hazard</u>	The hazard has historically occurred and may have significant impacts to people and property.
Scores with a value Of 0 <u>No Presumed Risk</u>	The hazard is extremely unlikely to impact the community, thus, the community has not taken it into consideration for mitigation actions.

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Probability

The probability score reflects the likelihood of the hazard occurring in the near future. Historical data of the hazard event occurring in Butler County or Iowa informed the likelihood of future occurrence.

Probability Score Definitions		
Score	Description	
1	Unlikely	<i>Less than 10% probability in any given year (up to 1 in 10 chance of occurring), a history of events is less than 10% likely or the event is unlikely but there is a possibility of its occurrence.</i>
2	Occasional	<i>Between 10% and 20% probability in any given year (up to 1 in 5 chance of occurring), history of events is greater than 10% but less than 20% or the event could possibly occur.</i>
3	Likely	<i>Between 20% and 33% probability in any given year (up to 1 in 3 chance of occurring), history of events if greater than 20% but less than 33% or the event is likely to occur.</i>
4	Highly Likely	<i>More than 33% probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely or the event is highly likely to occur.</i>

Magnitude or Severity

The magnitude or severity of the hazard event is measured by the level of impact on the human environment. Property damage is assessed by the whole planning area.

Magnitude or Severity Score Definitions		
Score	Description	
1	Negligible	Less than 10% of property severely damaged, the shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid
2	Limited	10% to 25% of property severely damaged, shutdown of facilities and service for more than a week, and/or injuries/illnesses that do not result in permanent disability.
3	Critical	25% to 50% of property severely damaged, shutdown of facilities and services for at least two weeks, and/or injuries/illnesses that result in permanent disability.
4	Catastrophic	More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths.

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Warning Time

This should be taken as an anticipated warning time.

The warning time score assesses the ability to warn a population before the hazard occurs. The values of the score range from 1 (at least 24 hours) to 4 (minimal or no warning time).

For many of the climate hazards, there is a considerable amount of warning time as opposed to the human-caused hazards (transportation and hazardous materials incidents) that occur instantaneously or without any significant warning time.

Warning Time Score Definitions		
Score	Description	
1	Forecasted	More than 24 hours warning time.
2	Likely	12 to 24 hours warning time.
3	High Chance	6 to 12 hours warning time
4	Imminent	Minimal or no warning time (up to 6 hours warning)

Duration

The duration is the time of a typical or expected hazard event to occur. For an earthquake or traffic accident that is a score of 1. For infrastructure failure, it is likely a 4.

Table 6 displays rated risk scores for each associated hazard. This assessment was completed by city representatives based on hazard profiles prepared for the planning committee.

Duration Score Definitions	
Score	Description
1	Less than 6 hours
2	Less than 1 day
3	Less than 1 week
4	More than 1 week

Table 10: Hazard Risk Assessment					
Hazards	Probability	Magnitude	Warning Time	Duration	Score
Severe Winter Storm	4	3	3	3	3.45
River Flood	3	4	3	4	3.4
Thunderstorm/Lightning/Hail	4	3	3	1	3.25
Transportation Incident	4	2	4	1	3.1
Pandemic Human Disease	3	3	2	4	2.95
Hazardous Materials	3	2	4	3	2.85
Flash Flood	3	2.5	3	2.5	2.8
Levee/Dam Failure	2	3	3	3	2.55
Extreme Heat	3	2	1	4	2.5
Tornado/Windstorm	2	2	4	1	2.2
Drought	2	2	1	4	2.05
Animal/Crop/Plant Disease	2	2	1	4	2.05
Grass/Wild Land Fire	2	1	4	1	1.9
Sinkholes	1	1	4	1	1.45
Expansive Soils	1	1	1	1	1
Infrastructure Failure	1	1	1	1	1
Earthquake	0	0	0	0	0
Landslides	0	0	0	0	0
Radiological Incident	0	0	0	0	0
Terrorism	0	0	0	0	0

Source: Completed by City Representative. Calculated score completed by INRCOG.

* The hazard is extremely unlikely to impact the community, thus, the community has not taken it into consideration for mitigation actions.

Hazard Mitigation Goals

in Greene, Iowa

The following list of goals was developed by planning committee participants from the associated jurisdiction. Goals 1 through 7 were developed in the previous 2020 Butler County Multi-Jurisdictional Hazard Mitigation Plan. The planning committee participants chose to adopt the same goals and add additional goals after review.

- Goal #1** Minimize to the greatest possible extent the number of injuries and/or loss of life associated with all identified hazards.
- Goal #2** Reduce or eliminate property damage due to the occurrence of disasters.
- Goal #3** Improve response operations in the event of a disaster.
- Goal #4** Return the community to either a pre-disaster or improved conditions in a timely manner in the wake of a disaster.
- Goal #5** Develop strategies that can be used to reduce the community's overall risk to the negative effects of natural, technological, and man-made disasters.
- Goal #6** Reconvene the planning committee annually to review the plan document, check for compliance with the plan goals, and track progress in achieving the mitigation strategies.
- Goal #7** Maintain the Countywide Multi-Jurisdictional format for future updates.

Previous Mitigation Activities by Type

Mitigation actions and activities in this Plan will be organized according to these 5 categories: Emergency Services, Education and Outreach Projects, Natural Resource Protection or Natural Based Solutions, Structural Projects, or Local Plans and Regulations.

Emergency Services in Greene

Butler County Emergency Management Agency

Greene works with the Butler County Emergency Management Coordinator, based out of the City of Allison, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The Butler County Emergency Management Coordinator is Chris Showalter.

Law Enforcement

Greene contracts with the County Sheriff's Department for police services. The department is based out of Allison, Iowa. They handle a range of essential services, including routine patrols, emergency response, and criminal investigations.

Fire Protection and EMS Services

Fire protection for the City of Greene is provided by the Greene Fire Department. The station is located at 301 Old School Road. There are 15 volunteer fire fighters that serve in the department currently. Each of the members is HAZMAT certified Firefighter 1 trained. There are several

members that have Firefighter 2 training, and others with driver/operator training. Dispatch is provided via a paging system called I Am Responding app that is accessible through a phone app.

The Greene Fire Department maintains 28E agreements with surrounding communities to provide additional support when needed and required.

Equipment used by the Greene Fire Department includes the following:

- Jaws of life
- Hydraulic pumps
- Fire trucks
- Rescue pumper
- Top Kick

EMS Services

Butler County EMS represents all 8 of the EMS service in the County. Butler County Board of Supervisors deemed EMS an Essential Service for the County according to Iowa Code Chapter 422D and recently hired an EMS Coordinator to provide coverage and support for EMS services within the county.

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Medical Facilities

The City of Greene has MercyOne Greene Family Medicine at 104 E Traer Street that offers a full range of services for community members.

The Waverly Health Center in Waverly is located approximately 18 miles southeast and the Franklin General Hospital in Hampton is located approximately 32 miles southwest.

HAZMAT Response Teams

Greene contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center, but it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten-county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities of the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

The jurisdiction also partners with the Northeast Iowa Response Group for assistance in responding to any

methamphetamine labs located in the city limits. The Response Group assists the Police Departments in the containment of the site and disposal of hazardous chemicals.

Warning Systems in Greene

1. Tornado Sirens

Greene has a tornado warning siren system with a 30-year life use and does not expect to replace within the next 3 to 5 years. It is approximately 10 years old.

The activation systems of the sirens are activated and operated by trained Green Fire Department storm spotters.

2) Alert Iowa Mass Communication System

Butler County has implemented the use of Alert Iowa, a mass communication notification system. The system features are controlled through the Butler County Emergency Management Agency. Residents can customize their alert settings including the type of alerts they would get.

Alert Iowa allows for emergency notifications via landline telephones, cell phones, email, text messages, and social media. This is useful for communities that may not have an operating warning siren or may not hear the sirens. The County will use its emergency notification network for all the following events: blizzards, flash flooding, severe thunderstorms, and tornadoes. There is an optional way to receive the same alert for events such as: excessive heat warnings, hazardous materials warnings,

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heavy snow warning, high wind warnings, ice storm warnings, law enforcement warnings, shelter in place warnings, sleet warnings, wind chill warnings, and winter storm warnings.

Public Works/Street Department

The Public Works Department is located at City Hall at 202 W South Street.

Education and Outreach Projects in Greene

Greene currently has E911 Emergency Assistance in place. Other communications used by city personnel include pagers, radios, and cellular telephones. Radio, television, cellular telephones, landline telephones, newspapers, warning sirens, and NOAA Radio Service are available to the public at large. The City has developed a website in order to keep its citizens, and other interested parties, aware of local and government affairs. The website address is <https://greeneia.org/>. The City also has a social media account for local notifications and updates. Announcements are also made available in the local Greene Reporter newspaper.

The City partners with KLMJ 104.9 for radio announcements.

Natural Resource Protection in Greene

Greene does not have any natural resources protection actions.

Structural Projects in Greene

The City does not have any major structural projects that have taken place recently.

Local Plans and Regulations in Greene

Greene completed a local plan and regulation assessment. The results are shown in the following table.

Table 11: Local Regulatory Capability Assessment	
Community	City of Greene
Previous HMP Participant?	Yes
Comprehensive Plan?	Yes
Building Code?	Yes
Zoning Ordinance? RR=restricted residential	Yes
Subdivision Regulations?	Yes
Floodplain Management Ordinance?	Yes
Tree-Trimming Ordinance?	Yes
Storm Water Ordinance?	Yes
Snow Removal Ordinance?	Yes

Timeframe	Description
Immediate	1 - 6 months
Short Term	1-3 years
Mid-Term	3-5 Years
Long-Term	More than 5 Years

Cost	Estimated Cost Range
Minimal	Less than \$10,000
Low	\$10K to \$99K
Moderate	\$100K to \$299K
High	Greater than \$300K

How to Use the Implementation Guide in this Plan

Notes about the tasks (listed as line items) on the tables on the following pages.

- Each task (line item) stands on its own so it can be completed whenever possible.
- Each action item is not limited to the details presented below and may change based on future conditions.
- The tasks were categorized based on mitigation type. The mitigation types are not shown in any order (no priority over the other).

This implementation strategy is presented to help with the general understanding of how hazard mitigation may feed into the City’s existing or future priorities.

Priority Level

The priority level was informed through discussions among planning committee members who considered potential benefits of implementing the activity, some hurdles that the city may face in implementing the action step, and the drawbacks of implementation. *Committee representatives considered a cost-benefit approach.*

Timeframe & Estimated Costs

Cost estimates are based on the associated costs of additional staffing that may or may not be needed, time for planning/meetings/coordinating, and cost of the proposed action/program/ project. The time frame to complete the column is based on four designations (see table to the left).

Strategic Implementation Guide for Hazard Mitigation Activities

Table 12: 'Education and Awareness' Type Mitigation Activities						
Description: These types of actions keep residents informed about potential natural disasters.						
Priority	Tasks	Hazard(s)	Primary Agency Responsible for Implementation	Time Frame to Complete	Estimated Cost (s)	Funding Source
High	Enhance community resilience by providing residents with the knowledge, tools, and resources need to effectively prepare for, respond to, and recover from natural and man-made hazards.	All	City Clerk	Immediate	Minimal	City General Fund
Medium	Work with Butler Public Health to educate the public on pandemic human disease prevention and animal disease.	Pandemic Human Disease, Animal/Crop/Plant Disease	Butler County Public Health, City Clerk	Mid-Term	Minimal	City General Fund
High	Educate the public on outdoor warning sirens to ensure compliance by community during severe weather.	All	City Clerk; Butler Emergency Services	Short-Term	Minimal	City General Fund; Butler Emergency Services

Table 13: 'Emergency Services' Type Mitigation Activities						
Description: Actions that protect people and property during and immediately after a disaster or hazard event.						
<i>Priority</i>	<i>Tasks</i>	<i>Hazard(s)</i>	<i>Primary Agency Responsible for Implementation</i>	<i>Time Frame to Complete</i>	<i>Estimated Cost (s)</i>	<i>Funding Source</i>
High	Update communication equipment for emergency services agencies for disaster response including but not limited to radio upgrades.	All	City Clerk; Butler Emergency Services	Short-Term	Moderate	City General Fund; Butler Emergency Services
Medium	Work with local police and fire response team to update planning responses to transportation, infrastructure, and hazardous materials response.	Transportation Incidents, Hazardous Materials, Infrastructure Failruers	City Clerk; Hazard Mitigation Committee; Butler Emergency Services;	Short-Term	Minimal	City General Fund; Butler Emergency Services
Medium	Purchase additional warning sirens for unserved areas of the community.	All	City Clerk; Butler Emergency Services	Short-Term	Moderate	City General Fund; Butler Emergency Services
Medium	Ensure an adequate number of safe rooms are available for the community for use during a disaster.	All	City Clerk; Butler Emergency Services	Short-Term	Moderate	City General Fund; Butler Emergency Services

Table 14: Structure and Infrastructure Project Type Mitigation Activities						
Description: Actions that either modify existing buildings or structures to protect them from a hazard, or removal from the hazard area.						
Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete Action	Estimated Cost(s) to Implement	Funding Source
High	Enhance the City's resilience to flooding events by elevating properties in flood prone areas as needed to at least above 100-year floodplain.	River Flood, Flash Flood, Levee Failure	City Council	Long-Term	High	City General Fund; Hazard Mitigation Grant Program, Flood Mitigation Assistance Grant Program
High	Enhance the City's resilience to flooding events by reducing properties located within flood prone areas.	River Flood, Flash Flood, Levee Failure	City Council	Long-Term	High	City General Fund; Hazard Mitigation Grant Program, Flood Mitigation Assistance Grant Program
High	Make critical infrastructure improvements that protect wastewater treatment plant from future flooding events.	River Flood, Flash Flood, Infrastructure Failure	City Council	Long-Term	High	City General Fund; Hazard Mitigation Grant Program, Flood Mitigation Assistance Grant Program; SRF
Low	Collaborate with utility companies to prioritize and implement the burial of power lines, reducing vulnerability to severe weather events, minimizing power outages, and enhancing community resilience and safety.	Thunderstorm, Tornado/Windstorm, Flash Flood, Severe Winter Storm, River Flood, Infrastructure Failure	Utility Provider, City Council	Long-Term	High	Grid Resilience Utility Grants, Hazard Mitigation Grants

Table 15: Natural System Protection and Nature-Based Mitigation Type						
Description: Actions that minimize damage and losses by preserving or restoring the functions of natural systems. This type of action can include green infrastructure and low impact development, nature-based solutions						
Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete	Estimated Cost (s)	Funding Source
High	Improve the functionality and resilience of waterways by implementing measures that include cleaning, reseeded, maintaining grass levels, preventing dirt infiltration, and providing ongoing maintenance to ensure greater effectiveness.	River Flood, Flash Flood, Levee Failure	City Council	Short-Term	Minimal	City General Fund; DNR Grants
Low	Promote community initiatives to encourage the planting of grass, native plants, and other ground cover on open lots to prevent soil erosion, mitigation impact of droughts, and improve stormwater absorption.	Extreme Heat, Grass/Wildfire, Drought, Plant Disease, Sinkholes, Expansive Soils	City Clerk	Mid-Term	Minimal	City General Fund

Table 16: Local Plans and Regulations Mitigation Activities						
Description: Actions by administrative or regulatory processes which direct how land and buildings are developed and built. These actions include regulations by public entities to reduce hazard losses.						
Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete Action	Estimated Cost(s) to Implement	Funding Source
High	Update ordinances and building codes that establish consistency and improved effectiveness in addressing the city's hazard mitigation goals.	All	City Council	Short-Term	Minimal	City General Fund
High	Establish clear enforcement practices that ensure ordinances and codes are followed at a local level.	All	City Council	Short-Term	Moderate	City General Fund
Low	Develop a water rationing plan in the need of a severe drought.	Extreme Heat, Drought	City Clerk, Public Works Director, City Council	Mid-Term	Minimal	City General Fund