Audubon County Multi-Jurisdictional Hazard Mitigation Plan 2025

U.S. Department of Homeland Security
FEMA Region 7
11224 Holmes Road
Kansas City, MO 64131

FEMA

August 13, 2025

John Benson
Director
Iowa Department of Homeland Security and Emergency Management
7900 Hickman Rd. Suite 500
Windsor Heights, IA 50324

Subject: Approval of the Audubon County Hazard Mitigation Plan

Director Benson:

In accordance with applicable[1] laws, regulations and policy, the Risk Analysis Branch of the Federal Emergency Management Agency (FEMA) Region 7 has approved the Audubon County Hazard Mitigation Plan. The attached Local Mitigation Plan Review Tool lists participants receiving approval that have submitted required adoption documentation.

Mitigation plans may include additional content to meet Element H: Additional State Requirements or content the local government included beyond applicable FEMA mitigation planning requirements. FEMA approval does not include the review or approval of content that exceeds the applicable FEMA mitigation planning requirements.

The approval period for this plan is from August 7, 2025, through August 6, 2030. The same official plan expiration date applies to all participating jurisdictions, regardless of adoption date.

An approved plan is required to maintain eligibility for funding under FEMA's Hazard Mitigation Assistance (HMA) programs. All funding requests will be evaluated individually based on the specific eligibility criteria and requirements of the applicable HMA program.

Based on FEMA's review, the plan did not meet all elements required for the Rehabilitation of High Hazard Potential Dams (HHPD) grant program. Thus, the participating jurisdictions are not eligible for assistance from the HHPD Grant Program at this time. If any participating jurisdictions with HHPDs are interested in this assistance, they should contact the FEMA regional mitigation planner identified below to learn more about how to meet the required mitigation planning elements for this program.

Having an approved mitigation plan does not mean that mitigation grant funding will be awarded. Specific application and eligibility requirements for the programs listed above can be found in each FEMA grant program's respective policies and annual Notice of Funding Opportunities, as applicable.

[1] Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and National Dam Safety Program Act, as amended; 44 CFR Part 201, Mitigation Planning; and Local Mitigation Planning Policy Guide (FP-206-21-0002, April 11, 2025).

To avoid a lapsed plan, the next plan update must be approved before the end of the approval period, including adoption by the participating jurisdictions. Before the end of the approval period, please allow sufficient time to secure funding for the update, including the review and approval process. Please include time for any revisions, if needed, and for the jurisdiction to formally adopt the plan after the review, if not adopted prior to submission. This will enable them to remain eligible to apply for and receive funding from FEMA's mitigation grant programs with a mitigation plan requirement. Local governments, including special districts, with a plan status of "Approvable Pending Adoption" are not eligible for FEMA's mitigation grant programs with a mitigation plan requirement.

We look forward to discussing options for implementing this mitigation plan. If you should have any questions or concerns, please contact Bryan Murdie, Risk Analysis Branch Chief, at 202.257.7627 or bryan.murdie@fema.dhs.gov.

Sincerely,

Laurie L. Bestgen, Director
Mitigation Division

Attachment: Local Mitigation Plan Review Tool

Table of Contents

Chapter 1: Introduction..... 3
Chapter 2: Community Profiles..... 9
Chapter 3: Local Hazard Analysis & Risk Assessment..... 21
Chapter 4: Vulnerability Assessment and Loss Estimates....65
Chapter 5: Mitigation Strategies..... 69
Chapter 6: Plan Maintenance and Adoption.....79
Appendix A: Rural Audubon County.....83
Appendix B: City of Audubon.....115
Appendix C: City of Brayton.....147
Appendix D: City of Exira.....167
Appendix E: City of Gray.....195
Appendix F: City of Kimballton.....215

Chapter 1: Introduction

Purpose

FEMA defines mitigation as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. The goal of mitigation is to decrease the need for response as opposed to simply increasing the response capability. For the purpose of this plan, mitigation discussions focus on specific actions taken to reduce loss of life and property from hazards by modifying the built environment and undertaking other actions to reduce the risk and potential consequences of these hazards.

Section 322 of the Stafford Act, 42 U.S.C. 5165 as amended by DMA 2000 (Public Law 106-390), provides for states, tribes, and local governments to undertake a risk-based approach to reducing risks of natural hazards through mitigation planning. FEMA implemented hazard mitigation planning provisions through regulations at 44 CFR Part 201. This plan was prepared in accordance to the regulations set forth in 44 CFR §201.6. Under this regulation, local governments must have an approved plan to apply for and/or receive funding through the Hazard Mitigation Grant Program, Pre-Disaster Mitigation, Flood Mitigation Assistance, and Severe Repetitive Loss programs.

The purpose of the Audubon County Multi-Jurisdictional Hazard Mitigation Plan is to reduce the effects that hazards have on people and property in Audubon County. Hazard mitigation planning is the process through which hazards that threaten jurisdictions are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are identified, prioritized, and implemented. This document will be used to plan and prioritize future mitigation projects in Audubon County. This plan will comply with the appropriate Federal and State laws and planning requirements while making the county and communities eligible for certain federal disaster assistance, specifically the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program, Pre-Disaster Program, and the Flood Mitigation Assistance Program.

Two of the most important components of emergency management deals with disaster recovery and hazard mitigation. Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage. This plan demonstrates Audubon County's commitment to reduce risks due to hazards, and serves as a tool to help decision makers facilitate mitigation activities and resources.

Assurance to Compliance with FEMA Requirements

This multi-jurisdictional mitigation plan complies with Iowa Homeland Security and Emergency Management Division's and FEMA's planning guidance; FEMA regulations, rules, guidelines, and checklists; Code of Federal Regulations; existing Federal and State laws; and such other reasonable criterion as the President/Governor, Federal/State legislatures and IHSEMD/FEMA may establish in consultation with local governments while the plan is being developed. This plan also helps with the minimum planning requirements for all FEMA mitigation

programs, such as the Flood Mitigation Assistance (FMA) Program, the Pre-Disaster Mitigation (PDM) Program, and the Hazard Mitigation Grant Program (HMGP), and where appropriate, other FEMA mitigation related programs such as the National Earthquake Hazards Reduction Program (NEHRP), the National Flood Insurance Program (NFIP), and the Community Rating System (CRS).

Planning Process

Region XII Council of Governments was hired by Audubon County to facilitate the development of the Multi-Jurisdictional Plan. Region XII used the FEMA prescribed process to complete this plan. The plan was developed by the Planning Team which included representatives from incorporated cities, local businesses and organizations, and local residents. Participants in the planning process and measures taken to solicit and encourage public participation are identified in the public participation section. Planning guidance from FEMA and IHSEMD has established a framework used to complete the planning process. This plan is organized around the four-phase process that includes: organizing resources, assessing risks, developing the mitigation plan, and implementing the plan. This plan is an update and looks different from previous plans as planning processes have changed, the planning team has more experience, good examples have been examined and plan update requirements are found throughout.

Meetings

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

Region XII staff moderated the committee meetings. There was no set time limit for each meeting, but most lasted between one and two hours, depending on the committee's discussion. Each city held meetings to discuss and adopt the hazard mitigation plan.

Region XII met with each jurisdiction individually during city council meetings or County Supervisor meetings throughout August, September and October of 2024. These meetings allowed Region XII staff to present an overview of the plan requirements as outlined in FEMA guidance, with particular note of multi-jurisdictional requirements. Previous critical facility maps were handed out along with the community profiles, and committee members were asked to add or remove facilities as necessary. To ensure accuracy, these maps were also sent to city staff. Discussion about which hazards should be included in the plan were held and the hazards identified in the 2023 State of Iowa Hazard Mitigation Plan was referenced. Committee members scored hazards based on probability, severity, warning time, and duration.

During city meetings, city staff and elected officials were given their respective community profiles, previous goals, and respective appendix. In order to determine plan goals, goals from the previous plan were handed out, and evaluated. The evaluation led to adding new goals, and the determination of what goals the committee wanted to include was completed. Along with the discussion of the goals were the mitigation actions, as these ensure that the city meets their goals. Each city's respective goals and mitigation actions can be found in their respective appendix. The County goals are located in Chapter 4.

When necessary, there were a couple additional meetings held to allow for additional input outside of the committee meetings. School board members were invited to their respective city meetings, but staff attended each school board for the adoption of the plan to answer any questions.

Participation

To be a participating jurisdiction, certain guidelines needed to be met. These guidelines include:

- An official of the jurisdiction must attend the planning team meetings;
- Participate in surveys and data collection activities;
- Participate in a local planning session in the jurisdiction, as needed, to finalize local elements of the plan;
- Review the plan draft and provide applicable feedback;
- Adopt the final plan.

The jurisdictions that participated in the creation of this plan include Audubon County, City of Audubon, City of Brayton, City of Exira, City of Gray, City of Kimballton, Audubon Community School District, and Exira-EHK Community School District. The following table lists the appointed committee members, the jurisdiction they represent, and the position they hold.

Audubon County Planning Committee		
Jurisdiction	**Name**	**Position**
Audubon County Emergency Management	Tyler Thygesen	County EMA
Audubon County	Heath Hansen	Supervisor Chairperson
City of Audubon	Palle Lansman	Mayor
City of Brayton	Cally Christensen	Mayor
City of Exira	Mike Huegerich	Mayor
City of Gray	Alecia Bluml	Mayor
City of Kimballton	Millette Shores	Mayor
Audubon Community School District	Trevor Miller	Superintendent
Exira-EHK Community School District	Trevor Miller	Superintendent

Other organizations were invited to participate in the planning process and develop projects within one or more of the jurisdictions. The following table lists people who attended at least one meeting in addition to the committee members. The input from the following individuals helped fully develop the Hazard Mitigation Plan.

Additional Plan Contributors		
Jurisdiction	Name	Position
City of Audubon	Andy Grabill	City Council
City of Audubon	Jason Hocker DVM	City Council
City of Audubon	Brandi Meyer	City Council
City of Audubon	James Richardson	City Council
City of Audubon	Brooke Wegner	City Council
City of Audubon	Janell Remsburg	City Clerk
City of Audubon	Bill Fankell	Citizen
City of Audubon/Audubon Community School	Joni Madsen	Citizen, Audubon Community School Teacher

Additional Plan Contributors		
City of Audubon	Warren Vickery	Citizen, Small Business Owner
City of Brayton	David Hansen	City Council
City of Brayton	Joan Meese	City Council
City of Brayton	Brooke Hansen	City Clerk
City of Brayton	Austin Christensen	City Employee
City of Brayton	Garrett Wilson	City Council
City of Brayton	Clint Fictner	City Attorney
City of Exira	Meg Andersen	City Clerk
City of Exira	Mark Paulsen	City Council
City of Exira	Dorreen Schrader	City Council
City of Exira	Nathan Wahlert	City Council
City of Exira	Tim Wahlert	Fire Chief/City Employee
City of Exira	Claire Asberry	Citizen, Small Business Owner
City of Exira	Blake Asberry	Citizen, Small Business Owner
City of Gray	Jake Olson	City Council
City of Gray	Judy Olson	City Council
City of Gray	Bryan Olson	City Council
City of Gray	Brandon Newman	City Council
City of Gray	Penny Schmidt	City Council
City of Gray	Cheryl Zinke	City Clerk
City of Kimballton	Adam Larsen	City Council/Small Business Owner
City of Kimballton	Tony Peterson	City Council
City of Kimballton	Brad Madsen	City Employee/Small Business Owner
City of Kimballton	Colby Madsen	Fire Chief
City of Kimballton	Randy Poldberg	Fire Department, Small Business Owner
City of Kimballton	Peggy Mortensen	Clerk, Small Business Owner
Audubon County	Doug Sorensen	Supervisor, Farmer
Audubon County	Rick Thompson	Supervisor
Audubon County	Chassity Musfeldt	Auditor Clerk
Audubon County	Mitchel Rydl	County Engineer
Audubon County	Beth Watson	Veteran's Affairs
Audubon County	Stacie Harris-Molina	Veteran's Affairs

This plan, as it includes many jurisdictions that serve one another provided a unique opportunity for the members of one jurisdiction to provide input for multiple jurisdictions. Fire departments from certain cities have jurisdictions that cover portions of the county, and many departments provide mutual and automatic aid on calls. This allows for department members to communicate concerns about jurisdictions outside their own, with evidence to back-up these comments. School districts overlap in similar fashions as the fire department jurisdictions. Many members of communities, while they reside in one community, may work or have business in others, allowing these members to spend large amounts of time interacting with other jurisdictions and being involved in jurisdictions outside their hometowns. This unique opportunity has created a large amount of information being shared on various jurisdictions during each jurisdiction's meeting.

Public Involvement

44 CFR 201.6(b): 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 planning approval.

Committee and additional meetings were open to the public. Agendas were posted in the Courthouse or respective jurisdiction prior to each meeting. Public outreach was strongly sought after at the mitigation action meeting, as well as during the draft plan period. The public was invited to each meeting as notice was given within the city's council meeting agenda, county supervisor agenda, or school board agenda. While the public was invited to attend and participate, no feedback was provided during these meetings from private citizens. All meetings were conducted in compliance with Chapter 21 of the Code of Iowa.

The hazard mitigation plan was discussed during various city council, county supervisor, and school board meetings, which are all conducted in compliance with the Iowa Open Meeting Law-Iowa Code Chapter. Many of the jurisdictions within this plan are small, rural, communities which in general have been considered underserved as resources are limited and these communities can be overlooked for programs which larger communities benefit from. All members of each community were reached using the same notification methods of regular meeting notifications which include posting on social media, posting around the community, notice on a jurisdiction's website, and sometimes notification in the newspaper.

When the plan reached draft stage, the public was encouraged to view it online and leave comments and criticisms. The plan was available in a paper format, but was uploaded to the Region XII website with a survey link also being available for public comment. Notice of the plan being available for public comment was made public through conversations with city officials and social media. There were no comments received from the public survey about th e plan and its contents. On October 10, 2024, a draft of the plan was uploaded to Region XII's website which is accessible to all members of the public. If the public wished to view the plan prior to this, they were able to request it from either their jurisdiction, either county, or Region XII COG. After October 10, as content and spelling/grammar changes were made, the newest draft was uploaded to the website. Jurisdictions were advised to use the link that would lead interested parties to the website, to reduce paper waste, and to ensure the newest draft was readily available. While the plan was made public through various postings on social media, links on websites, and a few newspaper postings, there were no comments received from the public about the plan or its contents.

Plan Content

This plan evaluates all aspects of hazard mitigation. The plan is split into six chapters, which serve as an overview for the plan. The first chapter is an introductory chapter which explains the planning process used in development of the plan. Audubon County's general background is given in chapter two. The planning process is put in motion by explaining the specific steps taken to generate each jurisdiction's risk assessment (chapter 3), vulnerability assessment and loss estimates (chapter 4), and mitigation strategies (chapter 5). The final chapter of the plan explains how the plan was adopted and how it will be maintained in the future.

Appendices A-F present the details of each jurisdiction's hazard mitigation plan outcomes. Each appendix includes the jurisdiction's critical infrastructure, risk assessment, vulnerability and loss estimates, mitigation strategies, flood maps (when applicable), and resolution adopting the plan.

Section 201.6 (c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Plan Content Updates/Changes

In all phases of the planning process, the planning team reviewed the existing sections of the plan and provided comments on necessary changes. Planning requirements from FEMA and other applicable bodies become increasingly stringent, requiring new and updated data.

Referenced Plans

Referenced plans throughout the planning process and within this document include:

- Iowa State Hazard Mitigation Plan, 2023
- Audubon County Hazard Mitigation Plan, 2019
- FEMA State and Local Hazard Mitigation Planning How-to Guides

Many other plans that are jurisdiction specific were utilized in the development of each jurisdiction's appendix. These plans included, but are not limited to: comprehensive plans, city codes, zoning codes, strategic plans, previous hazard mitigation plans, capital improvement plans, housing needs assessments, and building codes. These plans were used to develop portions of each jurisdiction's appendix.

Chapter 2: County Profile

Audubon County

History

Audubon County was established in the early part of the 1850's on land that was previously a part of Pottawattamie County. After the death of naturalist and artist John James Audubon in 1855, admirers named the new county in his honor. Early in the county's history, there was constant conflict over the location of the county seat. Reports as to where the first county seat was located are conflicted. One states that the first location was Hamlin's Grove, while another says Dayton. In 1857, the county seat moved to Viola, which later was incorporated (and still exists) as Exira.

The first official courthouse was built in 1871 in Exira after several communities battled to get the courthouse in their jurisdiction. The Rock Island Railroad was constructed in 1878, linking the larger City of Audubon to the City of Atlantic, and an election was held to determine whether Exira should retain the county seat position or if it should be moved to Audubon. The election determined that the county seat should move to Audubon. In 1939, Audubon County received grant funds to construct a new courthouse, which is still in use and is listed on the National Register of Historic Places.

Audubon County today is a quiet, rural community with a primarily agriculture economy. The County is located a little over an hours' drive from both the Des Moines and Omaha/Council Bluffs metro and is easily accessible by several state and federal highways. There are five incorporated cities in the County including Audubon, Brayton, Exira, Gray, and Kimballton.

Geography and Environment

Audubon County is located in west central Iowa and is surrounded by Carroll, Cass, Guthrie, and Shelby Counties. There are three major highways within the county: U.S. Highway 71 runs north and south throughout the county, Iowa Highway 44 runs east to west, and Iowa Highway 173 runs from Kimballton south to the county line. The City of Audubon, located in central Audubon County, is the county seat. The entire county covers approximately 444 square miles.

Audubon County's topography can be described as rolling. The northern portion of the county is gently rolling farmland with some areas of strongly sloping land dispersed throughout. The southern portion of the county has more variation in topography than the northern portion. The southern half has gently rolling hills and moderately steep topography. The highest elevation in Audubon county is 1,540 feet and is located in the west central part of the county. The lowest elevation can be found on the East Nishnabotna River at 1,180 feet. Map 2.1 displays Audubon County's elevation.

As agriculture is the county's main industry, the soil is one of the county's most valuable natural resources. Sand and gravel, found in the underlying soils on floodplains in the southern half of the county are also considered to be important natural resources. Table 2.1 displays Audubon County's soils and their different descriptions.

Map 2.1: Audubon County Elevation

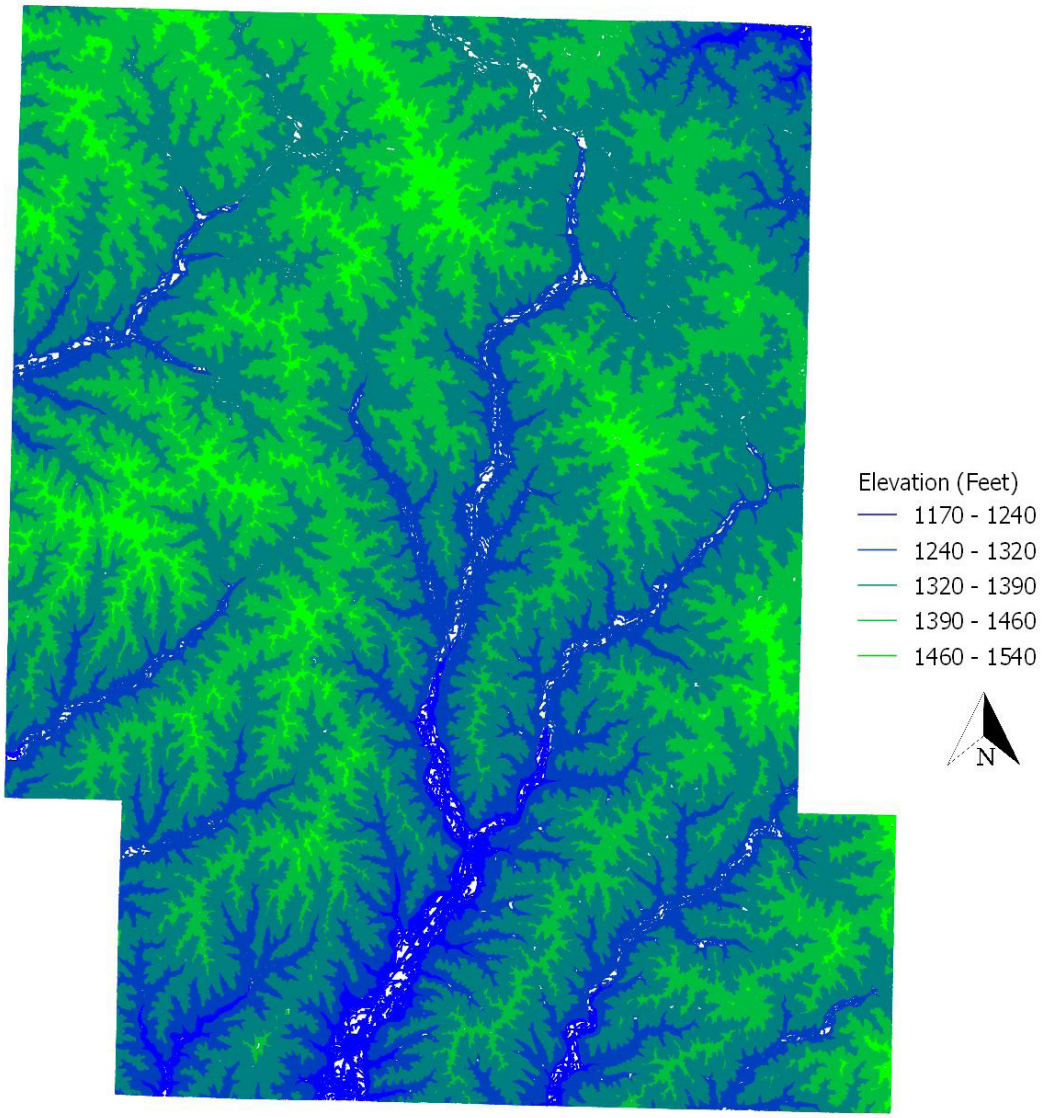


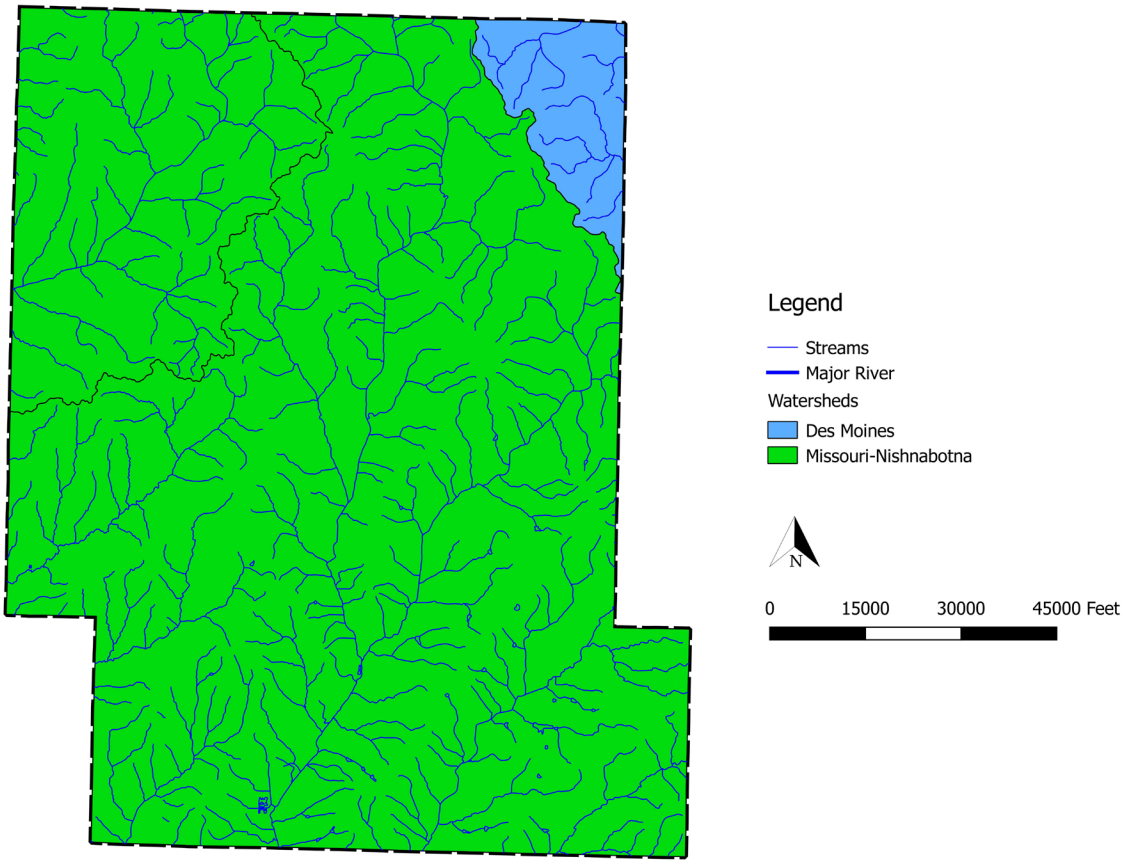
Table 2.1: Soils of Audubon County

Soil Association	% of County	Description
Marshall-Exira	48%	Moderately steep, well drained, silty soils formed in loess; moderately well suited for row crops
Marshall-Shelby-Adair	41%	Gently sloping to steep, well to somewhat poorly drained, silty and loamy soils formed in loess and glacial till; moderately well suited for row crops
Marshall-Gara-Shelby	9%	Gently sloping to very steep, well to moderately well drained, silty and loamy soils formed in loess and glacial till; best suited for pasture and timber
Shapsburg-Shel-by-Marshall	1%	Gently sloping to steep, well and moderately well drained, silty and loamy soils formed in loess and glacial till; well to moderately well suited for row crops
Colo-Ackmore-Zook	1%	Nearly level, poorly drained, silty soils formed in alluvium; nearly all is used for row crops

The East Nishnabotna River is the predominant waterway in the county and a number of the county's tributaries drain into this river, which spans the county from north to south. The western portion of the county drains into the West Nishnabotna River and the north east corner of the county drains into the Brushy Creek, which is a tributary of the South Raccoon River. The East and West Nishnabotna Rivers drain into the Missouri River, while the South Raccoon River drains into the Mississippi River.

In addition to rivers and streams, there is one designated lake within the county. Littlefield Lake at Littlefield Recreation Area is a 70-acre lake with a maximum depth of 20 feet. Scattered throughout the county are a number of small farm ponds, most of which are manmade. Map 2.2 displays Audubon County's waterways and watersheds.

Map 2.1: Audubon County Watersheds



Transportation

The principal highways in the county are listed in Table 2.2, in addition to the approximate mileage of farm-to-market and secondary roads in Audubon County. Audubon County contains one U.S. Highway and two State Highways. The average daily traffic is between 21,950 and 3,720 vehicles per day on U.S. Highway 71.

The five participating communities in Audubon County have roads to all developed areas. Most of the roads in the incorporated communities are seal coated or paved. Most communities have gravel roads as well. Western Iowa Transit offers public transit using an "on-demand" service throughout the county.

Audubon County Airport is the only airport located in Audubon County. It is located just south of the City of Audubon and has a runway that measures less than 3,000 feet. This airport is owned and operated by the Audubon County Airport Authority. The Iowa Aviation System Plan identifies the Audubon County Airport as a Local Service airport.

Table 2.2: Audubon Transportation Network

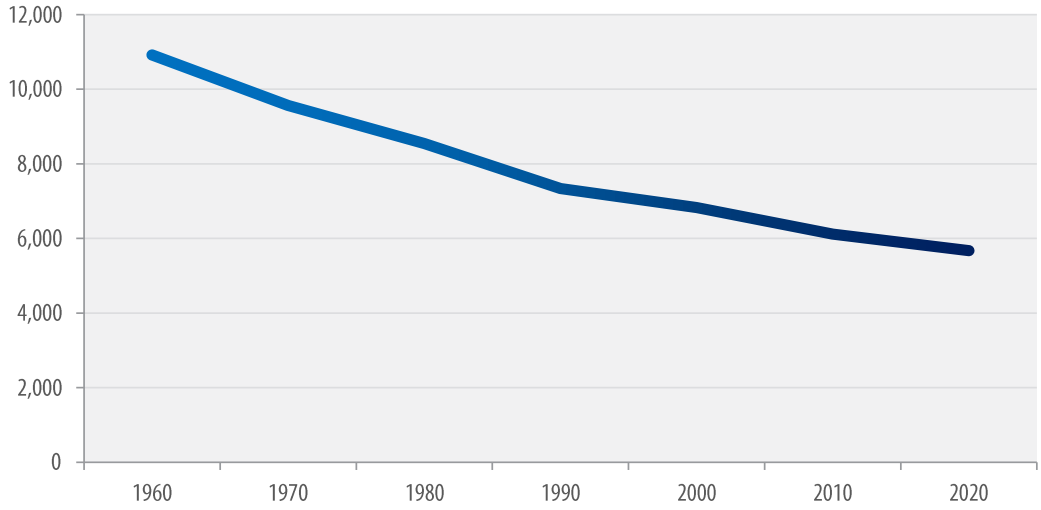
Roadway	Mileage (approximate)	Communities Served
U.S. Highway 71	25	Audubon, Brayton, Exira
State Highway 44	19	Kimballton
State Highway 173	3	Kimballton
Farm-to-Market	274	All
Secondary Roads (area serviced)	754	All

Demographics

The population of an area is one of the most important assets because without people, there is no labor force, entrepreneurs, taxpayers, and buyers of goods and services. Audubon county's population has seen an overall decline since 1960. There have been some periods of small growth, but the overall trend has been downward, limiting the amount of influence the population can exert on development. Since 2010, Audubon has lost over 7% of its total population. Since 2000, there has been a population loss of 17% in the county.

Population size, composition, and distribution influence the range of businesses a county can support, the pool of workers from which to draw, and the demand for and supply of services. Population trends give county leaders information on what kind of services need to be provided and offers prospective employers an overview of the local labor force. Figure 2.1 displays Audubon County's population from 1960 to 2020.

Figure 2.1: Audubon County Population: 1960-2020

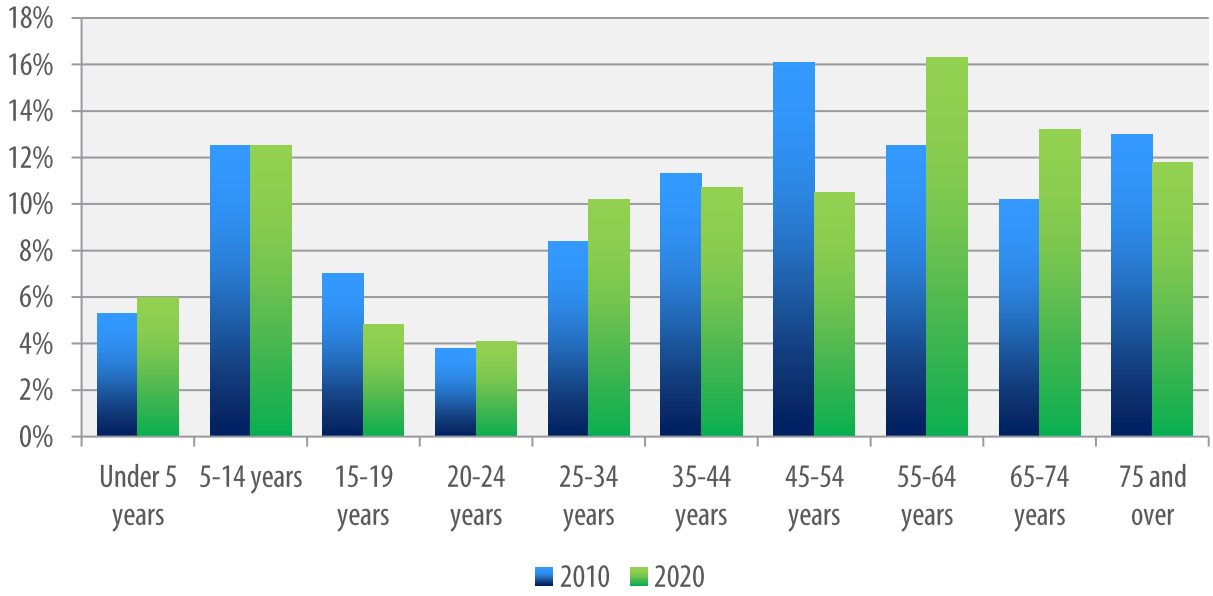


Source: U.S. Census Bureau

Population size, composition, and distribution influence the range of businesses a county can support, the pool of workers from which to draw, and the demand for and supply of services. Population trends give county leaders information on what kind of services need to be provided and offers prospective employers an overview of the local labor force.

Figure 2.2 compares the age distribution throughout Audubon County from 2010 to 2020. Overall, there has been a decline in the county's population since 2010, with the largest decreases occurring in the 45-54 and 15-19 year old ranges. The largest population increases happened in the 55-64 and 65-74 age cohorts. This is consistent with other rural Iowa communities, as it is normal to see a decrease in population in the 20-29 age cohort because a number of young adults tend to leave the county for education or other employment opportunities offered elsewhere. Once these individuals start families, many move home or back to a smaller community where the cost of living is lower.

Figure 2.2: Audubon County Age Distribution: 2010 & 2020



Source: U.S. Census Bureau

Housing

One of the most important aspects to attract new residents is housing, and attracting new residents is important to rural Iowa counties. The current housing stock, type of houses, and housing availability and affordability are determining factors for potential residents.

Between 2010 and 2016, Audubon County lost a total of 154 housing units. During the same time frame, the number of vacant homes increased by 11 units. These numbers are consistent with the population decrease the county has seen since 2010. The number of renter-occupied units increased by 11 units, while owner-occupied units decreased. Table 2.3 shows the housing trends for Audubon County from 2010 to 2022.

Table 2.3: Audubon County Housing Units: 2010 & 2022

	2010		2022	
	Number	Percent	Number	Percent
Occupied Housing Units	2,700	91.2%	2,535	90.4%
Owner-Occupied	2,157	79.9%	1,981	78.1%
Renter-Occupied	543	20.1%	554	21.9%
Vacant Housing Units	259	8.8%	270	9.6%
Total Housing Units	2,959	100.0%	2,805	100.0%

Source: U.S. Census Bureau, American Community Survey

This breakdown is important during hazard events due to the populations that occupy these units. Homeowners who occupy their home may be more likely to want to rebuild, while vacant homes, if damaged, would either sit vacant with no activity, or may be torn down. Renters are unpredictable as some may choose to stay within the same location, or they may decide to move.

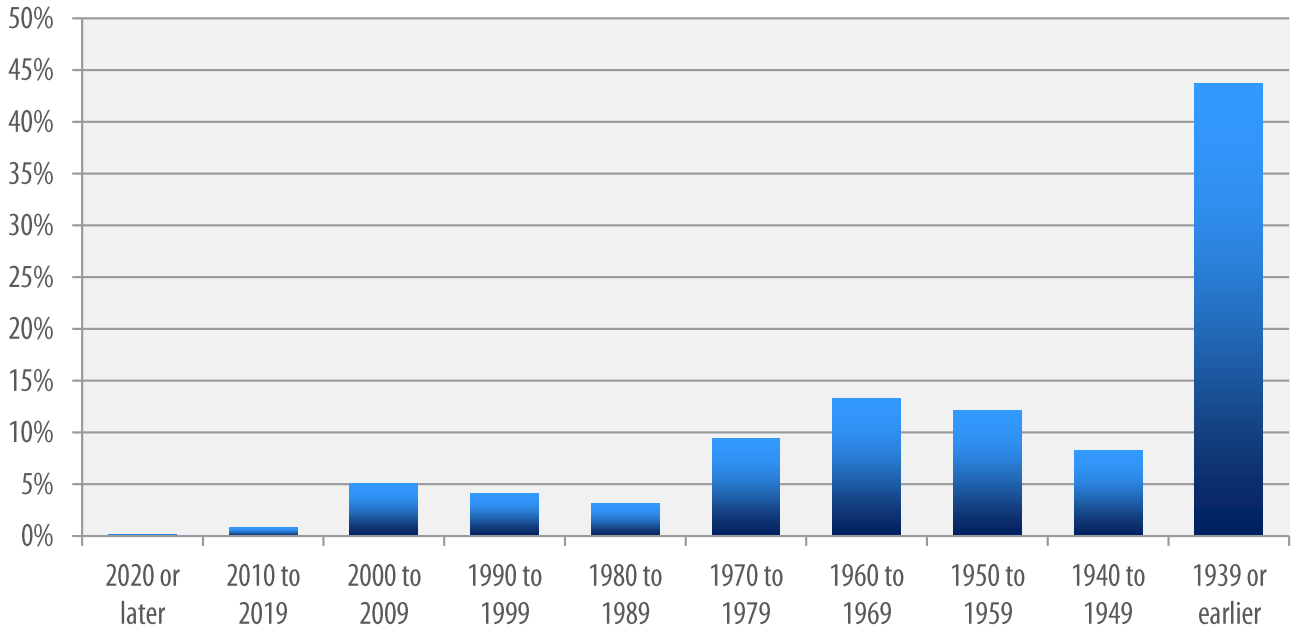
According to the 2022 American Community Survey Estimates (Table 2.4), the median housing value was $99,900. Over 50% of the homes in Audubon County are valued under $100,000, and of those 50.1%, 17.9% are valued less than $50,000. Since the population within the county continues to decline, it is unlikely that a large number of new homes will be built. Instead, the cities and county should invest in the rehabilitation of the existing structures. The rehabilitation of these homes will improve safety and reduce the susceptibility to numerous hazards.

Table 2.4: Audubon County Value of Owner-Occupied Units, 2022

Value of Housing Unit	Percent of Homes
Less than $50,000	17.9%
$50,000 to $99,999	32.2%
$100,000 to $149,999	17.0%
$150,000 to $199,999	11.1%
$200,000 to $299,999	12.2%
$300,000 to $499,999	5.6%
$500,000 to $999,999	2.1%
$1,000,000 or more	2.0%

Source: American Community Survey

Figure 2.3: Audubon County Year Housing Units Constructed, 2022



Source: American Community Survey

Figure 2.3 shows that 43.7% of the housing units in Audubon County were constructed before 1939. From 1940 to 1979, home construction was pretty steady, between 8% and 15% of the county's homes being built in each of these decades. Older homes generally show deterioration in the structural aspect and in the overall general features. These homes were built to the standards of the time, and may not meet current building codes and standards, making them more susceptible to damage from hazards such as fires, severe storms, and other hazardous weather conditions.

Survey estimates show that there have been minimal builds since 2010, which is consistent with the county's building permits. There have been new builds in rural areas and limited within the county's cities. Virtually all homes within the county have adequate gas or other fuel heating systems and kitchen facilities. Most homes are connected to the public water and sewer, except in rural areas, where many homes are connected to individual septic tanks regulated by the Audubon County Environmental Health Department, which is run through a contract with Guthrie County.

Economics

Household income is one of the most important indicators of the economic base in Audubon County. In 2016, Audubon County's median household income was $54,973, 22.1% behind the State of Iowa's median of $70,571. Over 15% of the county's households make less than $25,000 per year, while 23.1% of the households make over $100,000. An area's economy relies heavily on strong household income levels as higher incomes mean households have more spending power to purchase various goods and services. Higher income levels can be related to better employment opportunities, and changes to bring in workers from other counties. Table 2.5 shows the household income in 2022 inflation-adjusted dollars.

Table 2.5: Audubon County Household Income: 2022

Income (In 2016 Inflation-Adjusted Dollars)	Number of Households	Percent
Less than $10,000	125	4.9%
$10,000 to $14,999	63	2.5%
$15,000 to $24,999	211	8.3%
$25,000 to $34,999	304	12.0%
$35,000 to $49,999	485	19.1%
$50,000 to $74,999	385	15.2%
$75,000 to $99,999	376	14.8%
$100,000 to $149,999	355	14.0%
$150,000 to $199,999	135	5.3%
$200,000 or more	96	3.8%
Total households	2,535	100.0%
Median household income (dollars)	$54,973	--
Mean household income (dollars)	$72,306	--

Source: American Community Survey

The county's small rural towns primarily serve as agricultural service centers and retail trade centers, but manufacturing activity is also found in smaller areas throughout the county. Audubon County's strongest employment sectors are education and healthcare followed by agriculture. A complete breakdown of the workforce aged 16 and over by industry is found in table 2.6.

Audubon County has an active labor force, with a large percentage of both men and women participating. In 2022, only 0.4% of the County's labor force was estimated to be unemployed. Traditionally, the planning area's labor participation rate has been within the average or below average compared to Iowa, and much lower than the national average. Overall, Audubon County has a fairly stable economy with diverse industry sectors represented. Few employers have closed and new ones have opened, changing the economy's outlook.

Table 2.6: Employment by Industry, 2016

Industry	Number	Percentage
Civilian employed population 16 years and over	2,964	100.0%
Agriculture, forestry, fishing and hunting, and mining	439	14.80%
Construction	221	7.50%
Manufacturing	277	9.30%
Wholesale trade	136	4.60%
Retail trade	330	11.10%
Transportation and warehousing, and utilities	165	5.60%
Information	62	2.10%
Finance and insurance, and real estate and rental and leasing	121	4.10%
Professional, scientific, and management, and administrative and waste management services	139	4.70%
Educational services, and health care and social assistance	642	21.7%
Arts, entertainment, and recreation, and accommodation and food services	162	5.50%
Other services, except public administration	175	5.90%
Public administration	95	3.20%

Source: American Community Survey

Existing Documents & Capabilities

Table 2.7 provides a compilation of the current planning and regulatory documents in place for Audubon County. The table also shows the last update of each plan. These documents help the county mitigate the impacts of hazard events in the county. First and foremost, the previous hazard mitigation plan, as well as this document lays out specific strategies to help the city reduce the impact hazards have on the community and those who live in it. The County updated their comprehensive plan in 2023 and evaluated the past and future growth and utilized this plan to develop the county's new zoning ordinance. Between the comp plan and the updated zoning ordinance, it was determined that farmland is to be converted on a conservative basis, and that development should be contained within previously developed areas of the county to not create additional hazard impacts. Floodplain regulations have been implemented to ensure that no construction happens within the floodplain, or if it is to happen within the floodplain to ensure that all necessary regulations are met. The county has adopted state building codes to ensure that any construction that occurs meets Iowa State Building Code. This reduces the opportunity for structural fires, infrastructure failure, and reduces risks during a large number of other hazards.

Audubon County is the third smallest (population) county in Iowa. This small population size leads to a small tax base, which leads to a smaller overall county budget. While the County budget is smaller, it is still required to offer the same services to its residents as larger counties. This leaves a smaller budget left to do mitigation actions without outside assistance. The smaller budget has led to older infrastructure, limited planning, and reduced personnel. While the county itself is limited, it can be assisted by the local COG to assist with finding funding and additional planning opportunities. The county already is a part of numerous 28E agreements to examine the future health and safety of the county and expanding the number of these agreements would only continue to benefit the parties involved. Partnering with other counties and/or jurisdictions may be beneficial to completing necessary projects, of all types, and may create opportunities that previously may have not been possible.

Table 2.7: Audubon County's Existing Documents

Document	Yes/No	Year
Previous HMP	Yes	2019
Comprehensive Plan	Yes	2023
Building Code	State	-
Zoning Ordinance	Yes	2023
Strategic Plan	Yes	2003
Housing Needs Assessment	Yes	1999
NFIP Participant	No	-
Floodplain Regulations	Yes	2016

NFIP Participation

Audubon County does not participate in the NFIP, but several cities within the County do. Some of the county's maps were approved in 2016, so the county is eligible to participate, but would have to complete the application process to be eligible. The County does not participate in the NFIP due to the current lack of resources available to implement NFIP participation requirements. The county's flood maps can be found in Appendix A.

Outlook and Future Development

Since the last plan update, there has been little development in the rural portions of Audubon County. There have been some residential structures built outside of city limits, but these instances are limited. There has also been some industrial development/expansion in the northern portion of the county. Since the last plan update, a wind farm was completed and is now operational north of the City of Audubon.

Looking towards the life of this plan, the population of the rural part of the county is likely to continue a slow decline, as has been the case in recent years, with little growth likely within the City of Audubon as residential infill. Most rural development will be residential, but some may be commercial, industrial, and recreational. Conversion of farmland on a very modest scale is likely, but development is not likely in potential flood hazard areas.

Critical Facilities

Critical Facilities are facilities that are critical to the health and welfare of the population and are especially important following hazard events. Every jurisdiction is unique in such way that the list of critical facilities can vary widely from community to community. Examples of critical facilities include, but are not limited to: hospitals and other medical facilities, police and fire stations, emergency operations centers, evacuation shelters, public works facilities, schools and colleges, transportation systems (airways, highways, railways, waterways), lifeline utility systems (potable water, wastewater, oil, natural gas, electricity, communication systems), high potential loss facilities (nuclear power plants, dams, military installations), and hazardous material facilities (corrosives, explosives, flammable materials, radioactive materials, toxins, etc.). The critical facilities for Audubon County can be found in map 2.3 and are listed in table 2.9.

Essential Infrastructure and Services

Knowing what services and infrastructure serve the county as a whole, and each individual community can be beneficial in a time of disaster so the appropriate companies can be contacted in need of utility shutoff or transportation routes. The County's essential infrastructure and services can be found in table 2.8.

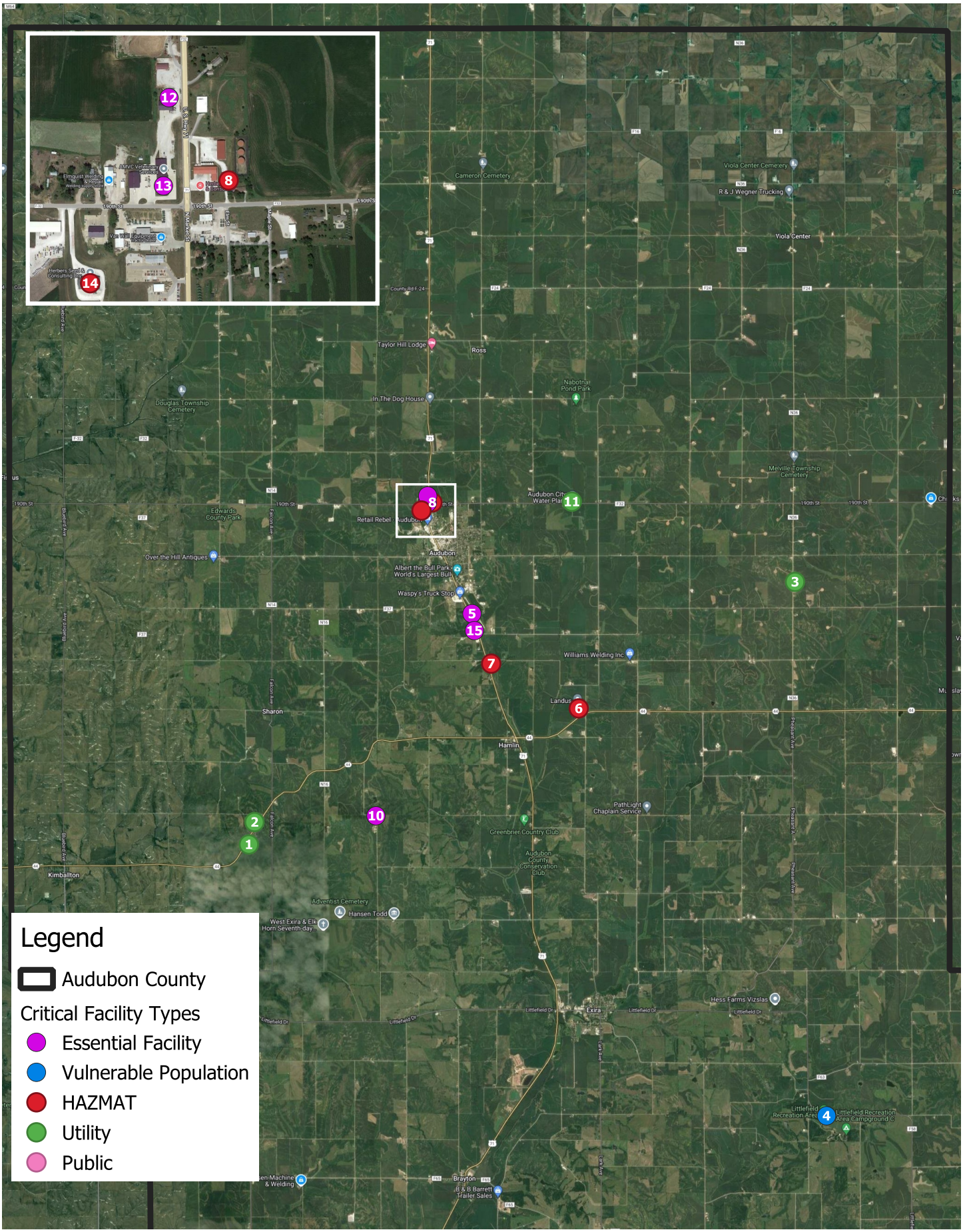
Table 2.8: Essential Infrastructure and Services

Major Arterials	US Highway 71, Iowa Highway 44 & Iowa Highway 173	**Air Service**	Audubon County Airport
Water Service	WCIRWA, Regional Water	**Sewer Service**	Individual Septic Systems
Electric Service	MidAmerican Energy	**Gas Service**	MidAmerican Energy
Sanitation/Solid Waste	Local Haulers	**Landfill**	Audubon Co. Transfer Station, Harrison Co. Landfill
Phone and Internet	Marne Elk Horn Telephone Co., Windstream, Mediacom, wireless	**Law Enforcement**	Audubon County Sheriff
Fire Service	4 city departments	**Ambulance Service**	Audubon Fire & Rescue, Exira Fire & Rescue, Elk Horn Rescue, Manning Fire & Rescue, Irwin Rescue, Templeton Rescue, Dedham Rescue, Adair Rescue, Anita Rescue

Table 2.9: Audubon County Critical Facilities

Number on Map	Name	Address	Type
1	WCIRW Water Tower	IA Highway 44	Utility
2	Cell Tower	IA Highway 44	Utility
3	Heartland Divide Wind Farm	2053 Pheasant Avenue	Utility
4	Littlefield Recreation Area	3108 Pheasant Place	Vulnerable Population
5	Audubon County Airport	2110 US-71	Essential Facility
6	Landus Cooperative	2287 Lark Ave	HAZMAT
7	Agriland FS Audubon	1914 220th St	HAZMAT
8	Herbers Seed	1898 Highway 71	HAZMAT
9	Adair Wind Farm	Southeast Audubon County	Utility
10	Audubon Co. 911/ISIC's Communication Tower	2512 Heron Avenue	Essential Facility
11	Western Minnesota Municipal Power Agency - Exira Station	3429 Jay Avenue	HAZMAT
12	AMVC Nutritional Services	1885 Highway 71	Essential Facility
13	AMVC Veterinary Services	1797 190th Street	Essential Facility
14	Herbers Seed	1782 190th Street	HAZMAT
15	Audubon County Secondary Roads	2147 Highway 71	Essential Facility

Map 2.3: Audubon County Critical Facilities



Chapter 3: Local Hazard Analysis & Risk Assessment

The hazard analysis and risk assessment (HARA) is a process for determining the emergency management needs for a jurisdiction. The determination is possible when the knowledge of the hazards is combined with the knowledge of the impact it would have on citizens and property within the jurisdiction. The HARA process includes four steps and shows the jurisdictions how frequently damage from a particular event could occur; the extent of damage; and which portions of the jurisdiction could be impacted during an event.

Step 1: Identify Hazards – determine which hazards can affect the jurisdiction.
What kinds of hazards can affect the jurisdiction? What happened in the past that the jurisdiction should have known about?

Many people are only aware of the most obvious risks, usually as a result of a disaster that affected their community in recent years such as a tornado or flood. In many cases, a large majority of the population is not aware of certain hazards because they have not affected the jurisdiction during their lifetime.

Step 2: Community Profile – determine if and to what extent these hazards will affect the assets of the jurisdiction.
What will be affected by these hazards? Are there buildings, roads, utilities, or other facilities in the jurisdiction that will be damaged or destroyed by these hazards? Are there concentrations of certain populations in the hazard area that are especially vulnerable, such as elderly, children, or non-English speaking people? Are there unique or symbolic characteristics about the jurisdiction that will be impacted adversely by a hazard? How will the economy of the jurisdiction or region be impacted by the occurrence of the hazard?

An inventory will help identify the assets that can be damaged or affected by the hazard event. In many cases, jurisdictional assets may be vulnerable to more than one type of hazard, in which the jurisdiction may need to look at different characteristics of the same asset to understand its vulnerability to each type of hazard. For example, if a building is subject to both floods and tornadoes, the jurisdiction will be interested in the location and elevation of the building in order to determine how much of the structure and its contents will be damaged by flooding. The jurisdiction will also be interested in the construction of the building and its ability to resist physical damage caused by high winds and debris during a tornado.

Step 3: Profile Hazard Events – determine how impactful a hazard can be
How "big" is each hazard's potential impact? Will it affect every area the same or will certain areas get hit harder than others? How often will each type of hazard impact the jurisdiction?

It is important to know the location and amount of land area that may be affected by certain hazard types. For example, there may be areas that can be affected repeatedly by a hazard in one part of the jurisdiction such as floodplains adjacent to streams and rivers or areas around chemical facilities, or there may be potential jurisdiction-wide impacts from events such as windstorms or winter storms.

Hazards can create direct damages, indirect effects, and secondary hazards to jurisdictions. Direct damages are caused immediately by the event itself, such as a bridge washing out during a flood. Indirect effects usually

involve interruptions in asset operations and community functions. For example, when a bridge is washed out due to a flood, traffic is delayed or rerouted, which then impacts individuals, businesses, and public services that depend on the bridge for transportation. Secondary hazards are caused by the initial hazard event, such as when flooding causes a dam break. While this is a disaster in its own right, its consequent damages should be included in the damage calculations of the initial hazard event. Loss estimations will include a determination of the extent of direct damages to property and indirect effects on functional use.

Step 4: Prioritizing Hazards – determine which hazards need to be addressed through mitigation planning
Which hazards are priorities for planning? Which hazards are candidates for special attention for response planning? Which hazards should mitigation efforts be focused on? Which hazards require further planning for post-disaster recovery?

Through completion of steps 1, 2, and 3, the hazards can be sorted by their composite score. The hazards with a higher score represent a higher risk to the jurisdiction. At first glance, the top third can be taken as the first priority group, the following third as the second priority group, and the remaining third as the third priority group. Adjustments can be made to this preliminary ranking by the planning team.

Since the last plan update was approved by the jurisdictions in 2019, there have been four disaster declarations within this plan's jurisdictions. Iowa disaster declaration DR-4421-IA affected Audubon County. This declaration was a result of severe storms and flooding beginning on March 12, 2019 and continuing. Due to Severe Storms, Straight-line Winds and Tornadoes that affected Audubon County on December 15, 2021, disaster declaration (DR-4642) was announced. For the COVID-19 Pandemic, DR-4483-IA and EM-3480-IA were declared. Declaration DR-4483-IA included the entire state of Iowa with the incident period being March 17, 2020 to May 11, 2023. Declaration EM-3480-IA also included the entire state of Iowa with the incident period being January 20, 2020 to May 11, 2023. More information about these declarations can be found in the applicable hazard section later in this chapter.

Table 3.1: State of Iowa Hazards

Natural	Non-Natural
Drought	Animal/Crop/Plant Disease
Tornadoes and other High Wind Events (including derechos)	Pandemic Human Disease
Flooding - River	Hazardous Materials
Flooding - Flash	Infrastructure Failure
Severe Winter Storms	Radiological Incident
Hail and Lightning Storms	Terrorism
Excessive Heat	Transportation Incident
Dam and Levee Failure	
Landslides	
Earthquakes	
Wildfire, including Grass Fire	
Sinkholes	
Expansive Soils	

Hazard Profiles

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

This plan's risk assessment was completed on a planning area wide basis, rather than analyzing each jurisdiction. Unique conditions within participating jurisdictions are noted in each hazard profile. School districts worked with their respective communities in determining the risk analysis scores, which gives them the same score as the community in which the district's assets are located.

The hazard analysis identified potential hazards that could affect Audubon County for the purpose of mitigation planning. It is important to note that the focus of mitigation is on reducing long-term risks of damage or threats to public health and safety caused by hazards and their effects.

To identify the hazards that threaten the planning area, the Hazard Mitigation Committee reviewed hazard data from the National Climatic Data Center among other sources, and discussed the impacts of each hazard required by FEMA, and natural and human-caused hazards that were included in the State of Iowa Hazard Mitigation Plan. Hazards that the committee determined could affect Audubon County are shown in table 3.6.

Table 3.2: Hazards Affecting Audubon County

Natural Hazards		Combination Hazards
Animal/Plant/Crop Disease	Grass/Wild Land Fire	HAZMAT Incident
Drought	Human Disease	Infrastructure Failure
Earthquake	River Flooding	Levee/Dam Failure
Expansive Soils	Severe Winter Storm	Radiological
Extreme Heat	Thunderstorm/Lightning/Hail	Terrorism
Flash Flood	Tornado/Windstorm	Transportation Incident

Not all of the hazards were determine to affect Audubon County. The hazard shown in table 3.7 was eliminated.

Table 3.3: Hazards Not Affecting Audubon County

Hazard	Reason for Omission
Sinkholes	There is no history of sinkholes in the counties. Source: IADNR, Iowa Geological Survey

Included in the assessment of each hazard is a statement recognizing the potential that the hazard will impact the jurisdiction over the life of the plan, and in some cases, breaks it down to within the next year. These statements rank the potential of the hazard impacting the jurisdiction into four categories which are shown and described below:

- Highly Unlikely - Less than 10% chance that this hazard will impact the jurisdiction within the noted timeframe
- Unlikely - 10% to less than 50% chance this hazard will impact the jurisdiction within the noted timeframe
- Likely - 50% to 90% chance the jurisdiction will experience the hazard within the noted timeframe
- Highly Likely - Greater than 90% chance the jurisdiction will experience the hazard within the noted timeframe

Animal/Plant/Crop Disease

An outbreak of disease that can be transmitted from animal to animal or plant to plan represents and animal/plant/crop disease. A disease outbreak will likely have economic implications, cause crop production losses, and possibly have environmental damages.

A plant disease is any abnormal condition that alters the appearance or function of a plant. It is a physiological process that affects some or all plant functions and may reduce the quality and/or quantity of the harvested product.

Fungi are the largest and perhaps most well-known group of plant pathogens. The vast majority of fungi do not cause disease. However, numerous fungi can cause plant disease, and a relatively small number of them cause disease in humans and livestock.

Bacteria are perhaps more familiar as the cause of human and animal diseases, such as tuberculosis and pneumonia. Nonetheless, some bacteria can also be destructive plan pathogens. Like bacteria, viruses are probably most familiar as the cause of human and animal diseases, such as influenza, polio, rabies, smallpox, and warts. Viruses, however, also cause several plant diseases.

Nematodes are microscopic, non-segmented, round, slender worms. Several thousand species of nematodes are found in soil, fresh and salt water, animals, and within or on plants throughout the world. Some nematodes are parasites on animals, plants, insects of fungi (Soybean Diseases-ISU Extension Office).

Table 3.4 displays some common plant and crop diseases found in Iowa. The animal diseases are either found in Iowa or could potentially be found in Iowa.

Table 3.4: Animal, Plant, and Crop Diseases

Animal	**Plant**	**Crop**	
Avian Influenza	**Trees**	**Corn**	**Soybean**
BSE "mad cow"	Anthracnose	Anthracnose Leaf Blight	Anthracnose Stem Blight
Brucellosis	Bur Oak Blight	Common Rust	Asian Soybean Rust
Chronic Wasting Disease	Cankers	Common Smut	Bacterial Blight
Epizootic Hemorrhagic Disease	Dutch Elm Disease	Ear Rot	Bacterial Pustule
Exotic Newcastle Disease	Emerald Ash Borer	Eyespot	Bean Pod Mottle
Foot and Mouth Disease	Leaf Spot	Gray Leaf Spot	Brown Spot
Johne's Disease	Oak Wilt	Nematodes	Cercospora Leaf Blight

Animal	Plant	Crop	
Pseudorabies	**Trees**	**Corn**	**Soybean**
Rabies	Pine Wilt	Northern Leaf Blight	Downy Mildew
Scrapie	Thousand Cankers Disease	Northern Leaf Spot	Frogeye Leaf Spot
Tuberculosis	Verticillium Wilt	Southern Rust	Root Rot
West Nile Virus	**Ornamental (Garden)**	Salk Rot	Soybean Cyst Nematode
	Anthracnose	Stewart's (Wilt) Disease	Soybean Mosaic Virus (SMV)
	Black Spot	**Alfalfa**	Stem Rot
	Crown Gall	Bacterial Wilt	Sudden Death Syndrome (SDS)
	Crown Rot	Crow Rot	
	Gray Mold	Fusarium Wilt	
	Leaf Spot	Nematodes	
	Nematodes	Root Rot	
	Powdery Mildew	Verticillium Wilt	
	Rose Mosaic		
	Tomato Spotted Wilt Virus		
	Verticillium Wilt		

Avian Influenza

Found amongst poultry, most Avian Influenza strains are classified as low pathogenicity and cause few clinical signs in infected birds. In contrast, high pathogenicity is a severe and extremely contagious strain that leads to death. This disease is of concern in Iowa because the state leads the nation in egg production. Production operations randomly test for the disease and will notify the Iowa Department of Agriculture and Land Stewardship (IDALS) if there is a sign of the disease.

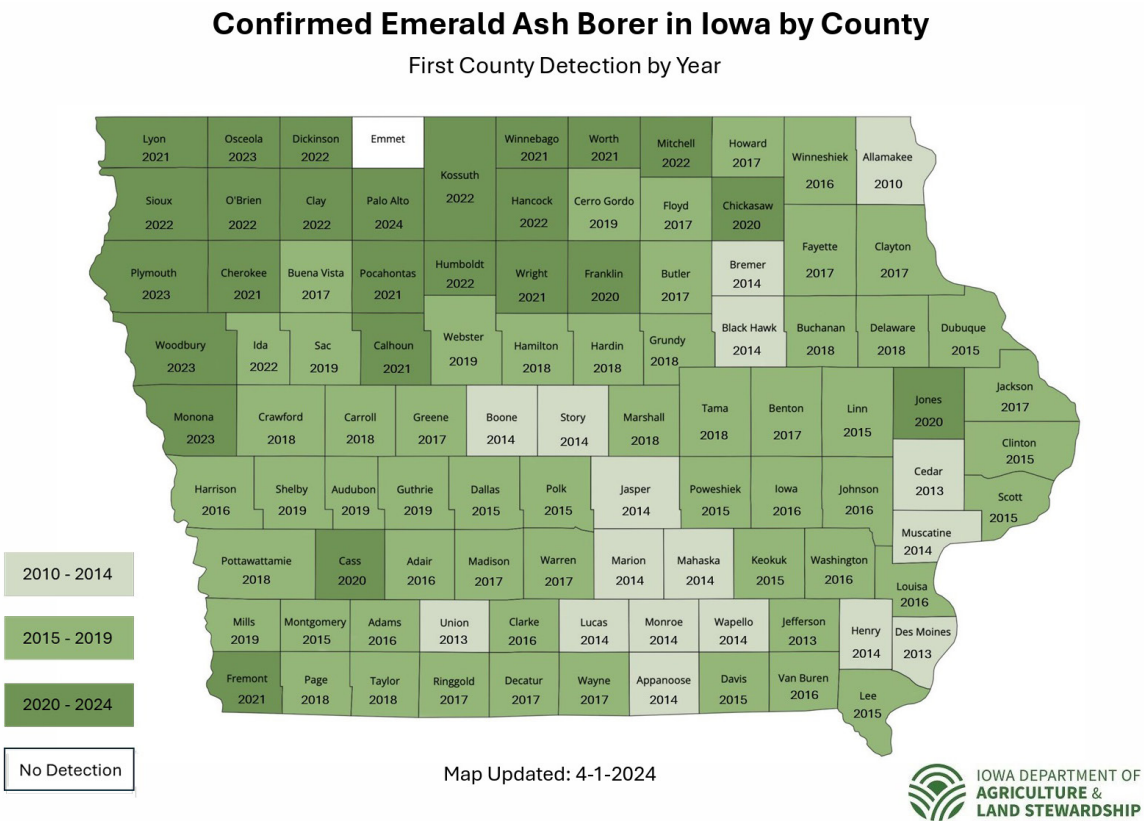
Emerald Ash Borer

Emerald Ash Borer (EAB) is a small green invasive wood-boring beetle that attacks and kills ash trees. The adults live on the outside of ash trees, feeding on the leaves during the summer. The larvae feed on the living plant tissue by tunneling underneath the bark of the trees, which disrupts the vascular flow and ultimately leads to the tree's death. EAB attacks native ash trees of any size, age, or stage of health and trees that have been attacked can die within two years.

Much of Iowa's forestland is densely populated with ash trees and Iowa's community street trees are heavily planted with ash cultivars. Iowa has an estimated 50 million rural ash trees and 3 million urban ash trees (USFS, 2008). EAB was first introduced to Iowa in May of 2010, when they were found on an island in the Mississippi River in Allamakee County. By 2012, EABs were caught in separate locations in Allamakee County, confirming that they had moved inland. EAB has since spread to 98 Iowa counties and have killed millions of ash trees.

According to the Iowa DNR the Emerald Ash Borer was discovered in Audubon County in 2019. Map 3.1 shows when the Emerald Ash Borer was discovered in the 98 affected Iowa counties.

Map 3.1: Iowa Emerald Ash Borer Detection



Rabies

Rabies is a deadly viral disease found in mammals that infects the central nervous system, ultimately causing disease in the brain and death. It is most often transmitted by animal bites, specifically in bats, skunks, coyotes, foxes, and raccoons. The rabies infection is nearly always fatal unless prompt treatment is administered before symptoms begin. In Iowa, the two most common strains are found in bats and skunks, and many different species can be infected with them. In 2012, thirty-one cases of animal rabies were reported in Iowa, consisting of seventeen bats, nine skunks, three bovine, and one feline. It is important to note that data is greatly influenced by the number of animals tested (Iowa Department of Public Health).

Soybean Cyst Nematode (SCN)

The SCN is the most important pathogen of soybean in Iowa. Damage may not be obvious; however, yield losses up to 40% on susceptible varieties are possible. Infected plants usually occur in patches within a field. SCN survives in the soil as eggs within dead females called cysts. These eggs can survive several years in the absence of a soybean crop. The second stage juvenile hatches from the eggs and infects soybean plants. Unfortunately, conditions that favor soybean growth are also favorable for SCN development. The number of SCN in afield can be greatly reduced through proper management, but it is impossible to eliminate SCN from a field once it is established (ISU Extension).

Stewart's (Wilt) Disease

Caused by bacteria, this disease is generally more destructive on sweet corn than on popcorn or dent corn. It is unique because its spread depends almost completely on an insect: the corn flea beetle. High levels of ammonium nitrogen and phosphorus tend to increase susceptibility, while high levels of calcium and potassium tend to decrease susceptibility. High temperatures also enhance development of the disease (ISU Extension).

In Audubon County, 96% of the land is dedicated to agricultural uses. With such a large percentage of land dedicated to agricultural uses including animal and crop uses, it is likely that animal/plant/crop diseases will impact at least a portion of the county annually. On average, these diseases do not cause widespread damage, but can last weeks to months. There have been some instances where an entire species of plant is effected and widespread damage is caused, i.e. Emerald Ash Borer. Climate changes including the increased average atmospheric temperature and increase in the moisture holding capacity of the air, it is anticipated that there will be increased pressure on agriculture from diseases and pests. As plant hardiness zones shift northward due to the warming climate, invasive plant and animal species may become more common. (Iowa Hazard Mitigation Plan, 2023)

While each instance of animal/plant/crop disease is different, there are some measures that may be taken to mitigate the spread of diseases.

- Not moving firewood from county to county
- Encourage reporting of potential disease outbreaks
- Encourage the use of preventative health care for animals
- Routine cleaning and disinfection
- Creating plans for preventing infections disease
- Creating plans for responding to infectious diseases
- Increased training for veterinarians and farmers about diseases and their presentations

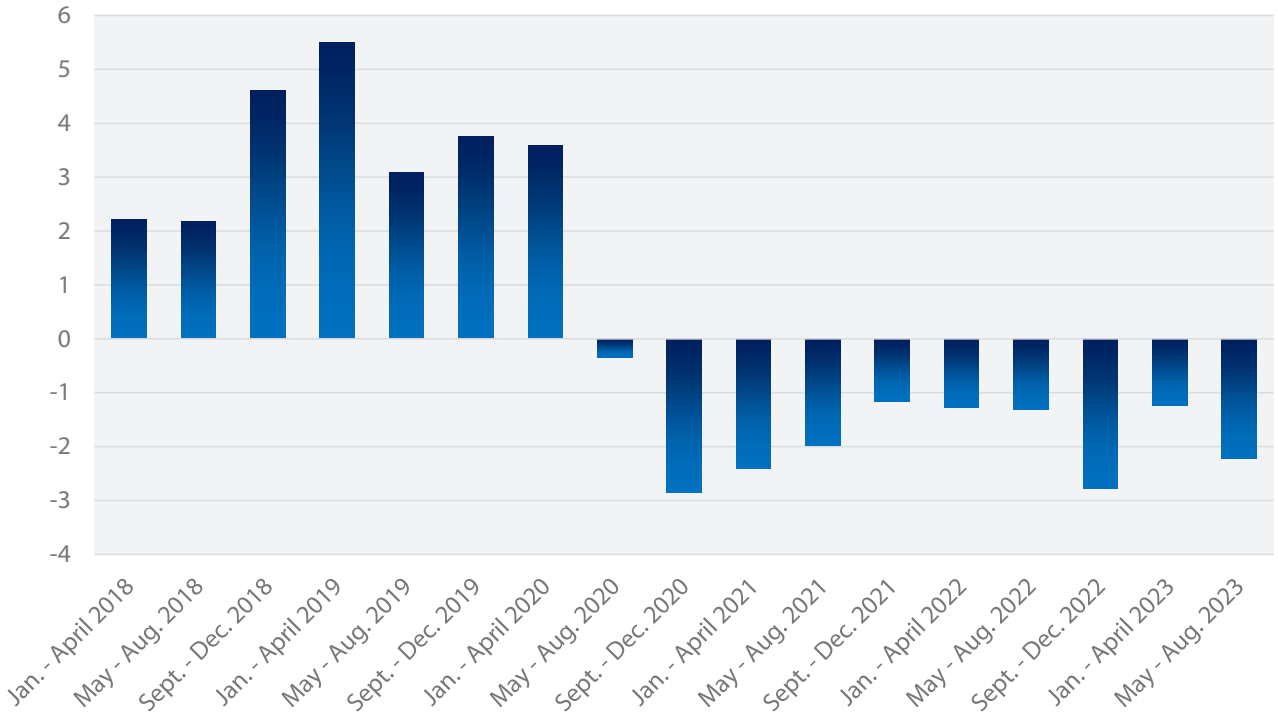
Drought

Droughts are defined as periods of prolonged dry weather that lasts long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area. The four ways droughts can be defined are meteorological, hydrological, agricultural, and socioeconomic. A meteorological drought is a drought that refers to the precipitation deficiency, hydrological droughts pertain to the declining surface and groundwater supplies, agricultural droughts refer to soil moisture deficiencies, and socioeconomic droughts refer to physical water shortages affecting people.

In Iowa, the highest occurrence of drought conditions are associated with meteorological and agricultural as a result of either a decline in precipitation or low soil moisture. Droughts can have widespread adverse economic, environmental, and social impacts as rivers, reservoirs, groundwater levels, and soil moisture decrease. Droughts can be spotty or widespread and last from a few weeks to a number of years. During prolonged droughts, communities can notice serious impact on their water supply and economy, and increased demand for water and electricity may result in shortages of resources. If agricultural production is damaged or destroyed by a loss of crops or livestock, food shortages can occur. While droughts are generally associated with extreme heat, droughts can and do happen during cooler months.

The Palmer Drought Severity Index (PDSI) was developed by Wayne Palmer in the 1960s and uses temperature and rainfall information in a formula to determine dryness. The PDSI is most effective in determining long-term drought (several months) and is not as efficient with short-term forecasts. An advantage of the Palmer Index is that it is set to local climate, so it can be applied to any part of the country to demonstrate relative drought or rainfall conditions. The Palmer Index uses 0 as normal, with drought conditions shown as negative numbers and excess rainfall shown as positive numbers. Figure 3.1 displays the Palmer Drought Severity Index for the State of Iowa from 2018-2023. The Palmer Drought Severity Index has seven categories of wet and dry conditions that are displayed in table 3.5.

Figure 3.1: Palmer Drought Severity Index, 2018-2023



Source: NOAA

Table 3.5: Palmer Drought Severity Index

Numerical Value	Condition
-4.0 or less	Extreme Drought
-3.0 to -3.9	Severe Drought
-2.0 to -2.9	Moderate Drought
-1.9 to 1.9	Near Normal
2.0 to 2.9	Unusual Wet Spell
3.0 to 3.9	Very Wet Spell
4.0 or more	Extremely Wet

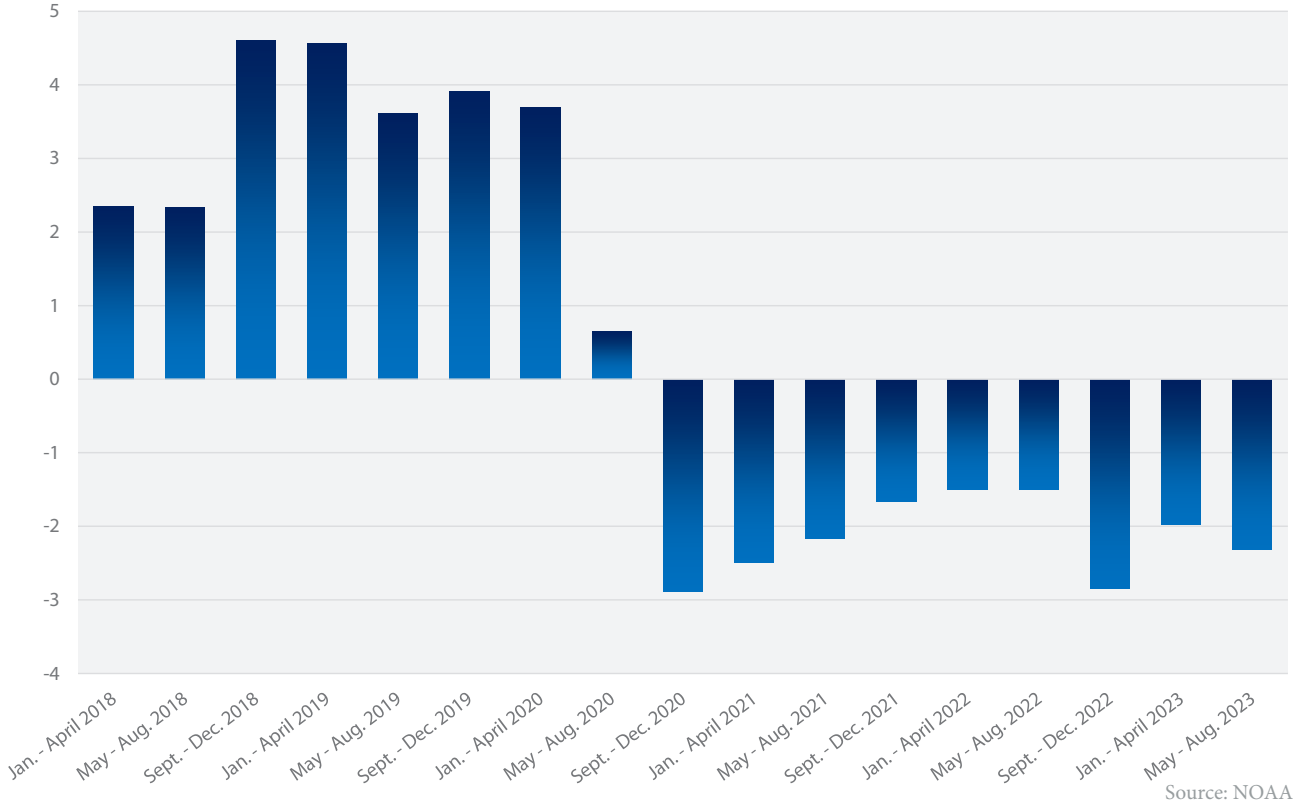
Source: NOAA

The Palmer Hydrological Drought Index (PDHI) shows hydrological drought and wet conditions, which more accurately reflect groundwater conditions, reservoir levels, etc. The hydrological impacts of a drought take longer to develop and longer to recover, therefore PDHI responds more slowly to changing conditions than PDSI. Figure 3.2 shows the Palmer Hydrological Drought Index for Iowa from 2018-2023

Since 2019, Audubon County has experienced eighteen recorded droughts. The National Center for Environmental Information did not report any drought damage due to the droughts. These eighteen instances of drought occurred from July 2020 to March 2024. There were 465 days with drought conditions for an average drought of 26 days per instance.

Future drought events are anticipated to increase due to climate change. Droughts may take on a seasonal aspect with excessive moisture in the spring and insufficient moisture during the summer. Iowa and Audubon County already sees wetter spring and fall and dryer summers than in the previous climate decade. Expected higher temperatures will increase evaporation rates, intensifying naturally occurring droughts.

Figure 3.2: Palmer Hydrological Drought Index, 2018-2023



Source: NOAA

When droughts occur, they tend to affect more than just one county or state. It is likely that if one portion of Audubon County experiences a drought, that the entire county as a whole would as well. As the agriculture sector is reliant on precipitation and when droughts occur it tends to be the most impacted sector. During water shortages, water dependent manufacturers are also affected. Drinking water is drawn from surface and groundwater sources, so prolonged droughts may affect all citizens if there were to be a drop in the stream flow coupled with the drop in the water table.

Over the past century, studies have been conducted that show meteorological droughts are never the result of one single cause. Scientists are not able to predict a drought more than a month or so in advance, as predicting droughts depends on forecasting precipitation and temperature. Anomalies of precipitation and temperature may last weeks, to months, to even decades and is dependent on several unstable weather systems at the global level. Drought prediction improvements differ by region, season, and climate. The U.S. Drought Monitor map provides a weekly summary of drought conditions across the United States and combines a variety of data-based drought indices, indicators and local expert input.

Droughts do not pose as much threat to physical structures as they do to humans and the environment. During the past five years, Audubon County has experienced eighteen drought events, but with none causing property or crop damage. These events also caused no deaths or injuries. With eighteen drought events happening within the county during the past five years, it is likely that the county will continue to see period of drought annually. The past five years saw multiple drought events each year. The previous reporting period saw no drought events within Audubon County.

While there are no mitigation actions jurisdictions can take to stop drought instances, there are actions that can be undertaken to alleviate the effects of them.

- Create a response plan
- Have a plan in place for reduction of water usage
- Educate the public on the effects of a drought and how they can do their part
- Encourage communities to create additional redundancy in their water systems to reduce loss

Earthquake

An earthquake is any shaking or vibration of the earth caused by the sudden release of energy that may impose a direct threat on life and property. It is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. This shaking can: cause buildings and bridges to collapse; disrupt gas, electric, and phone service; and sometimes trigger landslides, flash floods, and fires. (Iowa Hazard Mitigation Plan 2023).

An earthquake is any shaking or vibration of the earth caused by the sudden release of energy that may impose a direct threat on life and property. It is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. This shaking can: cause buildings and bridges to collapse; disrupt gas, electric, and phone service; and sometimes trigger landslides, flash floods, and fires. (Iowa Hazard Mitigation Plan 2023).

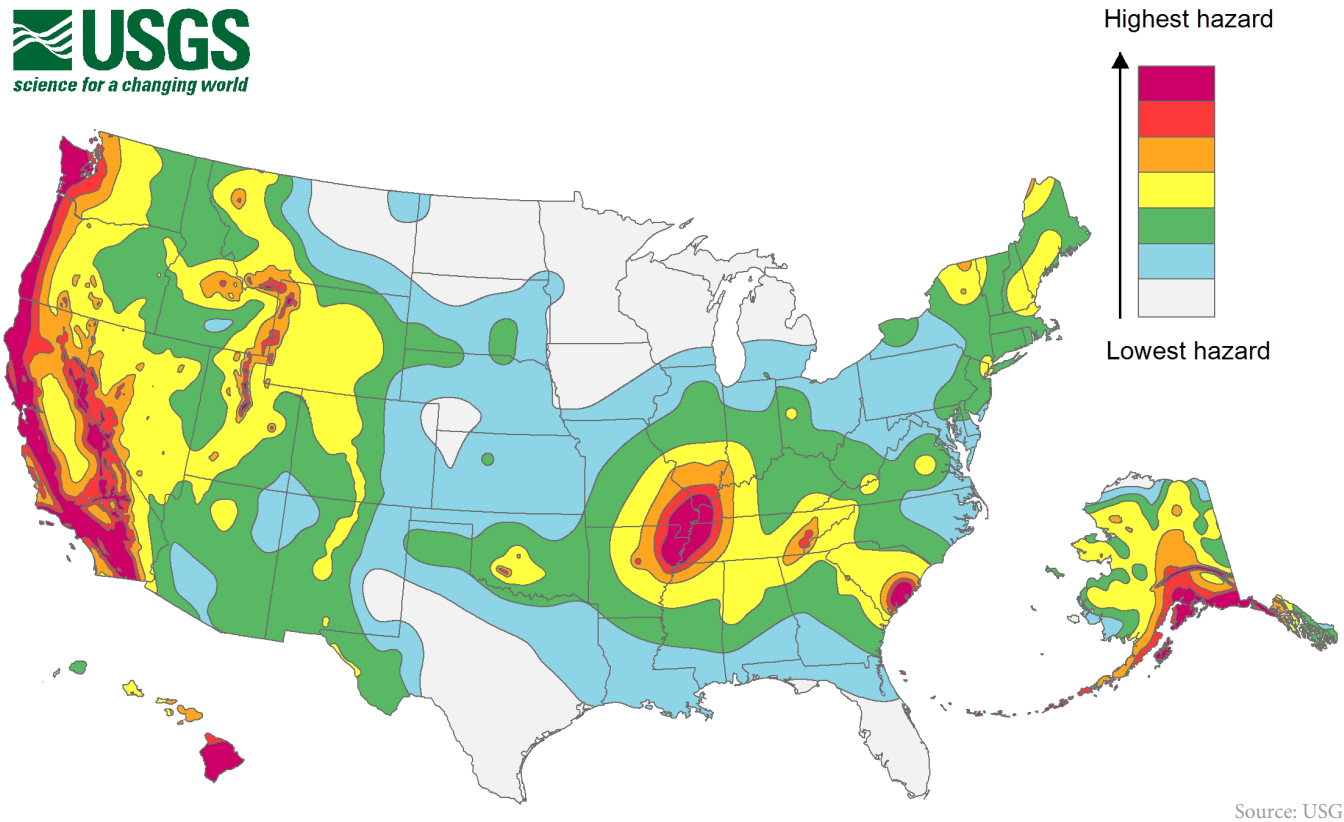
Audubon County is located in the lowest risk Seismic Zone. Previously this zone was categorized as Seismic Zone 1, but the USGS map shown in Map 3.2 recognizes this area as the lowest hazard zone. Most structures in Iowa are not built to earthquake standards, but because of the relatively low magnitude of a possible quake, property damage would likely be minor foundational damage. The most vulnerable structures are houses built on poorly consolidated substrate, especially floodplain materials.

Iowa as a whole has experienced the effects of only a few earthquakes in the past 175 years. The epicenters of thirteen earthquakes have been located in the state with the majority along the Mississippi River. While more than twenty earthquakes have occurred in or around Iowa over the past 175 years, they have not seriously impacted the state.

There is a low probability of an earthquake causing damage in Iowa, but that does not mean that Iowans could not feel the effects of an earthquake. Iowans may feel earthquake shaking on occasion, but it may feel more like the vibrations similar to a passing large truck. Southeast Iowa has a greater risk of damage than the other portions of the state.

Audubon County is located in lowest earthquake hazard designation areas. Due to the location of the county, it is highly unlikely that an earthquake will happen/have an impact on the county within the next five year. This designation comes from the United States Geological Survey which ranks areas based on the past faults and earthquakes, behavior of seismic waves as they travel through different parts of the U.S. crust, and the near-surface site conditions at a specific location of interest (USGS). Audubon County has not experienced an earthquake in the within the recorded past, and is unlikely to experience an earthquake in the future. The county does not rank within the top 10 most vulnerable counties in Iowa to earthquakes. Iowa as a whole anticipates $1,024,407 in expected annual loss due to earthquakes with the top ten counties anticipating $570,494 of that amount. The remaining 88 counties are anticipated to share the remaining $453,913 in expected annual loss (average of $5,158 per county). This information, coupled with the location of the planning area have assisted in the determination that this particular hazard is unlikely to effect the planning area. If an earthquake were to occur, it is more likely that the planning area would feel minor aftershocks and suffer extremely minimal damage.

Map 3.2: USGS 2018 Long-Term National Seismic Hazard Map



Source: USGS

Expansive Soils

Soils and soft rock that tend to swell or shrink excessively due to changes in moisture content are commonly known as expansive soils. The effects of expansive soils are most prevalent in regions of moderate to high precipitation, where prolonged periods of drought are followed by long periods of rainfall. The hazard develops gradually and seldom present a threat to life. The hazard occurs in many parts of the southern, central, and western United States. The availability of data on expansive soils varies greatly. For large areas of the United States, little information is reported other than field observations of the physical characteristics of clay.

The most extensive damage from expansive soils happens to highways and streets. Houses and one-story commercial buildings are most apt to be damaged by the expansion of swelling than are multi-story buildings, which usually are heavy enough to counter swelling pressures. The warning time for expansive soils is consistent with other geological hazards that occur slowly over time.

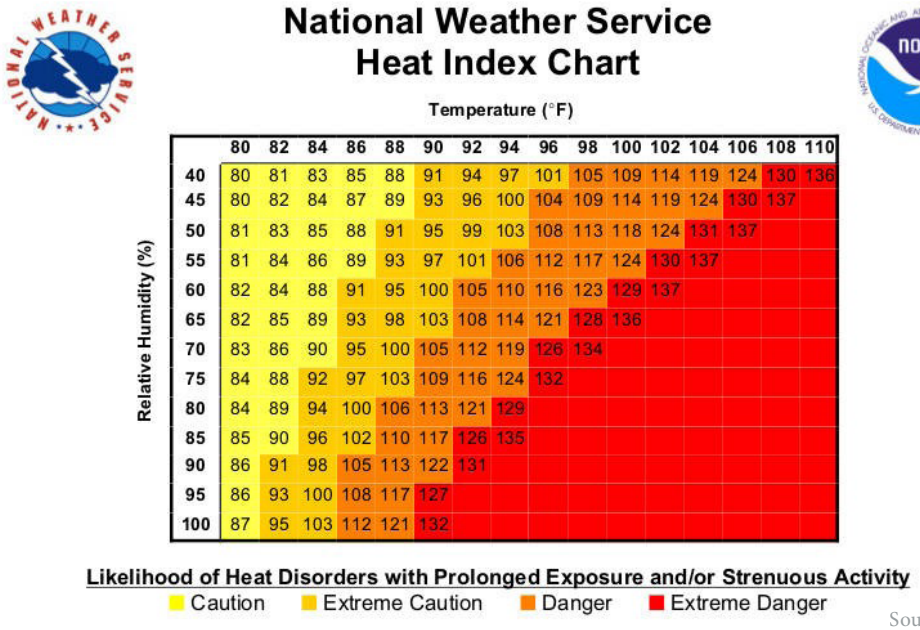
According to the 2023 State of Iowa Hazard Mitigation Plan, the impact climate change will have on expansive soils is uncertain. The plan states that the expected increase in the back and forth between heavy precipitation and drought could conceivably lead to more damage, but no research in the US was readily available to support this.

There have been no past instances of disasters associated specifically to expansive soils in Iowa (State of Iowa Hazard Mitigation Plan, 2023). It is highly unlikely that Audubon County will experience expansive soils throughout this plan's lifespan. Also, there is no comprehensive data available to compare losses throughout the region and State of Iowa. With no past instances of expansive soil damage or events within the planning area, including extensive mitigation measures for this hazard is unnecessary. One potential mitigation measure could be to test and analyze soils prior to construction to ensure proper codes are met.

Extreme heat is the number one weather-related killer in the United States, and has the highest 30-year average compared to other weather events. The 30-year average for heat-related deaths is 130 per year, 49 more than flooding, which has the second highest average. Extreme heat conditions are defined by summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. This includes temperatures (including heat index) in excess of 100 degrees Fahrenheit or at least three consecutive days of 90 plus degree weather. Heat advisories are issued at 105 degrees and warnings are issued at 115 degrees. A heat index is a temperature that tells how hot it really feels when relative humidity is added to the actual air temperature. When exposed to full sunshine, the heat index can be increased by 15 degrees. Figure 3.3 displays heat index and likelihood of experiencing a heat disorder with rising temperatures and humidity.

The body's ability to cool itself is affected during extreme heat. When the body heats too rapidly, to cool itself properly or when too much fluid or salt is lost through dehydration or perspiration, the body temperature rises and heat-related illnesses may develop. These illnesses can include heat cramps, sunstroke, heat exhaustion, and heat stroke. As heat stroke can be deadly, immediate medical attention is necessary.

Figure 3.3: National Weather Service Heat Index Chart



Source: National Weather Service

Since 2019, Audubon County experienced one extreme heat event. The event occurred on July 17, 2019 and lasted for four days. Heat index values during this time were consistently in the 105 to 115 degree range during the daytime with little relief during the nighttime when temperatures remained in the 70 to 80 degree range. Over the life of this plan, excessive heat instances are anticipated to increase. Days with maximum temperatures above 90 are projected to occur 2 to 5 times more often by 2050 in the best case scenario. Days above 100, currently occurring once every few years, are projected to happen several times per year by 2050. Days over 105 may not be rare either. 'Cooling degree days' will nearly double in about 50 years, straining energy systems and increasing chances of blackouts and brownouts (barring adaptation measures). These events can put extra stress on some jurisdiction's already stressed and aging electric grids.

Many factors can determine how extreme heat affects all types of life. Older adults, young children, people with disabilities, and those who work outdoors are more susceptible to illnesses caused by heat. Households that do not have air-conditioning are also more at risk as they cannot escape the heat. Livestock and other animals are also adversely affected by extreme heat and extreme heat at the wrong time can inhibit crop production. Roadways can also be distorted or even fail during extreme heat.

Audubon County is highly likely to experience at least one extreme heat event within the planning period. These events impact the county as a whole as extreme heat events are not constricted by jurisdictional boundaries. Extreme heat events can be predicted a few days in advance. When the heat index is expected to exceed 105 degrees for at least two consecutive days, the National Weather Service initiates alert procedures. Since extreme heat events have to have at least three days of 90 plus degree weather, these events are expected to last a minimum of three days, but no more than seven days. The extreme event that Audubon County experienced within the recent past have caused no property or crop damage and have caused no deaths. With proper precautions taken, there should be little to no harm done to humans or livestock.

While mitigation actions for jurisdictions are unable to stop excessive heat events, there are actions that can be taken to protect the populations from the effects of excessive heat.

- Create a response plan
- Designate cooling shelters and equip shelters with necessary items
- Suspend utility shutoffs during excessive heat events
- Publicize information related to personal safety during heat events

Flash Flood

Flash flooding is one of the most dangerous weather events because there is little to no warning time. Flash floods occur when the water along a stream or low-lying area rises rapidly. These events happen within six hours of a significant rainfall caused by heavy rainfall in a short amount of time from intense storms, slow-moving storms, or storms repeatedly moving over the same area. Other flash floods can be caused by dam or levee failures, or sudden releases of water held by an ice jam. Some flash floods are strong enough to roll boulders, tear out trees, destroy buildings or bridges, and scour out new channels.

Areas with dense populations are at a high risk of flash floods, as the construction of buildings, highways, driveways, and parking lots increase runoff. Streams through cities are sometimes routed underground into storm drains and during heavy rains, the storm drains can be overwhelmed and flood roads and buildings, particularly low spots such as underpasses, underground parking garages, and basements. Areas near rivers are at risk from flash floods. Levees are often built along rivers and used to prevent high water from flooding bordering land.

Nearly half of all flash flood deaths occur as vehicles are swept downstream after the driver drives onto the flooded highway. Six inches of fast-moving water can knock a person off their feet; water only twenty-four inches (two feet) deep can carry away most vehicles. The National Weather Service has the "Turn Around Don't Drown" program to educate the public about the dangers of floods and fast moving waters.

The National Weather Service has developed classes of flash flood warnings.

Table 3.6: Flash Flood Warning Levels

Base	Used most of the time, when flash flood impact is possible
Considerable	Used rarely, when there are indications flash flooding capable of unusual severity or impact is imminent or ongoing and urgent action is needed to protect lives and property.
Catastrophic	Used exceedingly rarely, when a flash flood threat to life and catastrophic damage is occurring or is imminent, and floodwaters have risen or will rise to levels rarely if ever seen.

Since 2019, Audubon County has not experienced any recorded flash flooding events. The planning area is highly likely to experience flash flood events at some point within the planning timeframe with varying degrees of intensity. Not all of these events will be recorded or do reported damage.

Land that is located within a floodplain or in low-lying areas are at the most risk of experiencing flash floods. Properties that have aging sewer systems can also be at risks due to the design of the drains. Older systems were designed for what was necessary at the time, and current capacities could be significantly larger. When possible, the National Weather Service forecasts flash flood watches 12-36 hours in advance when conditions look favorable for a flash flood. Although a watch is issued 12-36 hour in advance, warnings, on average, are issued thirty minutes to an hour before the flood occurs. These weather events start and end quickly. According to the NOAA Storm Weather Database, the flash floods in Audubon County lasted for an average of 4.5 hours.

While there is a good deal of information pertaining to river flooding for the state, data for flash floods is not readily available. Flash floods occur with little to no warning, and with no data being usable to predict future instances, it is important that Audubon County is prepared for these events as it is likely they will occur throughout this plan. While the county didn't experience a recorded event during the last reporting period, it has experienced flash floods in the past, and even though there were no deaths caused by these events, flash floods are unpredictable, and the jurisdictions need to be prepared for all results of a flash flood event. These events that happened caused property damage and it is important that the jurisdictions are prepared to minimize the damage caused by these events by implementing mitigation items prior to their occurrences.

Climate change is anticipated to increase the number of flash floods that impact the planning area. Precipitation is expected to increase in intensity, but may not increase in frequency. Average annual precipitation is anticipated to increase 1" to 4" by 2050, but heavy precipitation events are likely to be more common.

There are some mitigation actions that can be implemented to alleviate the effects of flash floods.

- Restore rivers and drainage districts to prevent flooding
- Encourage jurisdictions to participate in the NFIP or to continue their participation
- Encourage permeable pavement installation
- Educate homeowners about on-site stormwater management practices

Grass/Wild Land Fire

A grass/wildland fire is an uncontrolled fire that threatens life and property in either rural or wooded areas. When conditions are favorable, such as periods of drought when natural vegetation is drier, fires are more likely to occur.

Wildland fires are a serious threat to life and property in the United States. Fire seasons have become progressively worse over the past fifty years due to the combination of drought, warmer temperatures, high winds, and an excess of dried vegetation in forests and grasslands. As the wildland threat grows, so does the cost of fighting the fires. Although lightning is a common ignition source of wildland fires, nine out of ten fires are started directly or indirectly by people through debris burning, campfires, arson, discarded smoking products, sparks from equipment in operation, arced power lines, or other means.

Weather is the most variable of the factors that affect fire behavior. The combination of wind, temperature, and humidity affects how fast wildland fires can spread. Strong winds can push the flames toward new fuel sources or pick up and transfer burning embers, sparks, and other materials that are capable of starting "spot fires". Temperature affects the spread of wildland fires because the temperature of the fuel affects how quickly or slowly they will reach their ignition point and burn. Humidity dampens the fuel, slowing the spread of flames.

Grass and Wild Land fires are the most common types of fires that occur in Audubon County, and all jurisdictions

can be affected by this hazard. Most jurisdictions have been affected by a grass or wild land fire in the past, but these types of fires tend to occur in the rural parts of the county most often. Consistent and accurate data is not readily available for Audubon County, but in total, the area fire departments report multiple incidents per year.

Fire severity is a quantitative measure of the effects of a fire on the environment, typically considering both the damage to vegetation and the impacts on the soil. Fire severity is described along a spectrum, ranging from unburned/low severity, to moderate severity, and high severity. Fire severity is driven by multiple factors that affect how a fire behaves. Those factors are often depicted in what's called a "fire behavior triangle." The three major factors in the triangle are: the weather conditions during the fire (wind, temperature, humidity); the topography of the landscape (slope, aspect); and the amount, arrangement, and types of fuels that are present during the fire.

Table 3.7: Fire Severity

Low	A fire that has limited effect on overstory trees (<30% mortality), understory vegetation, and soils.
Moderate	A fire producing variable, moderate effects on overstory trees, averaging 30-80% of the vegetation killed, and/or moderate soil exposure.
High	A fire producing a high percent of overstory tree mortality (>80%) and/or extensive mineral soil exposure.

According to the National Interagency Fire Center (NIFC), the United States saw 68,988 fires resulting in 7,577,183 acres burned in 2022. Iowa reported 7 wildland fires resulting in 288 acres burned in 2022. The five year total for the State of Iowa (2018-2022) was 859 wildfires resulting in 20,440 acres burned. According to the NIFC, no fire in Iowa has been reported as a historically significant wildfire or a large wildfire (more than 100,000 acres). The NIFC puts out a monthly National Significant Wildland Fire Potential Outlook, warning areas where wildland fires have the potential to breakout.

Maps 3.3 and 3.4 on the next page show the likelihood of wildfires in Audubon County and the risk these fires pose to homes within the county. Utilizing available data, the jurisdictions within the county are anticipated to fight at least one grass/wildland fire annually throughout the life of this plan. The probability of fighting more than one annually is highly likely.

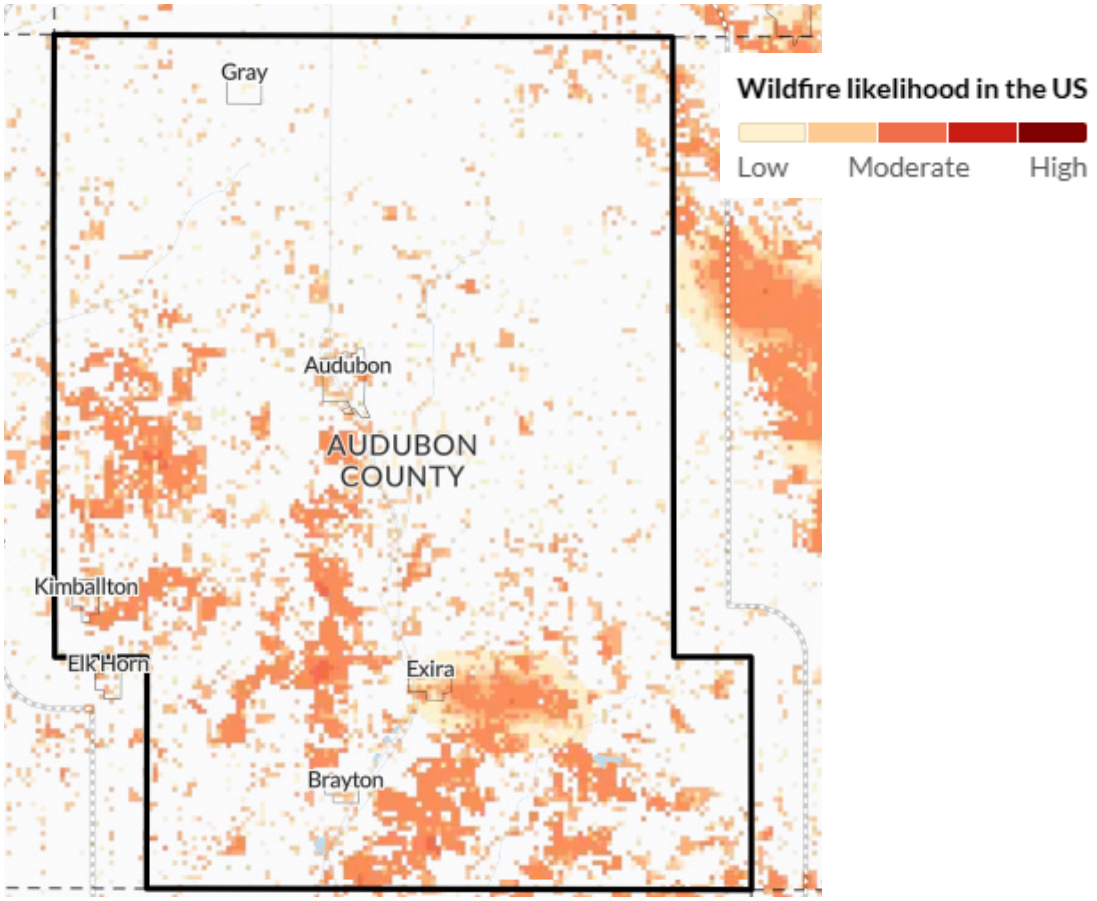
Most grass/wildland fires are contained to highway right-of-way and rail right-of-way ditches; however, high winds can turn a small fire into a multi-acre grass fire within a matter of minutes. The extent is dependent of weather conditions and topography. Grass/wildland fires occur without warning and can spread rapidly. The majority of Iowa wildfires are short in duration.

Grass and wildland fires are unpredictable and Audubon County is susceptible to these hazard events. While the county and its jurisdictions are at risk of grass/wildland fires, recent data has shown that the risk to humans is reduced. These fires tend to primarily damage crops and other property (including farm machinery). Fires are not uncommon in Iowa, therefore it is important that the jurisdictions are informed on the mitigation actions that can reduce the impact these fires have on the environment and population. These fires are anticipated to increase over the planning period. Droughts are anticipated to become more common due to climate change, which will make dry vegetation more prone to ignition. High temperatures will also pull moisture from vegetation.

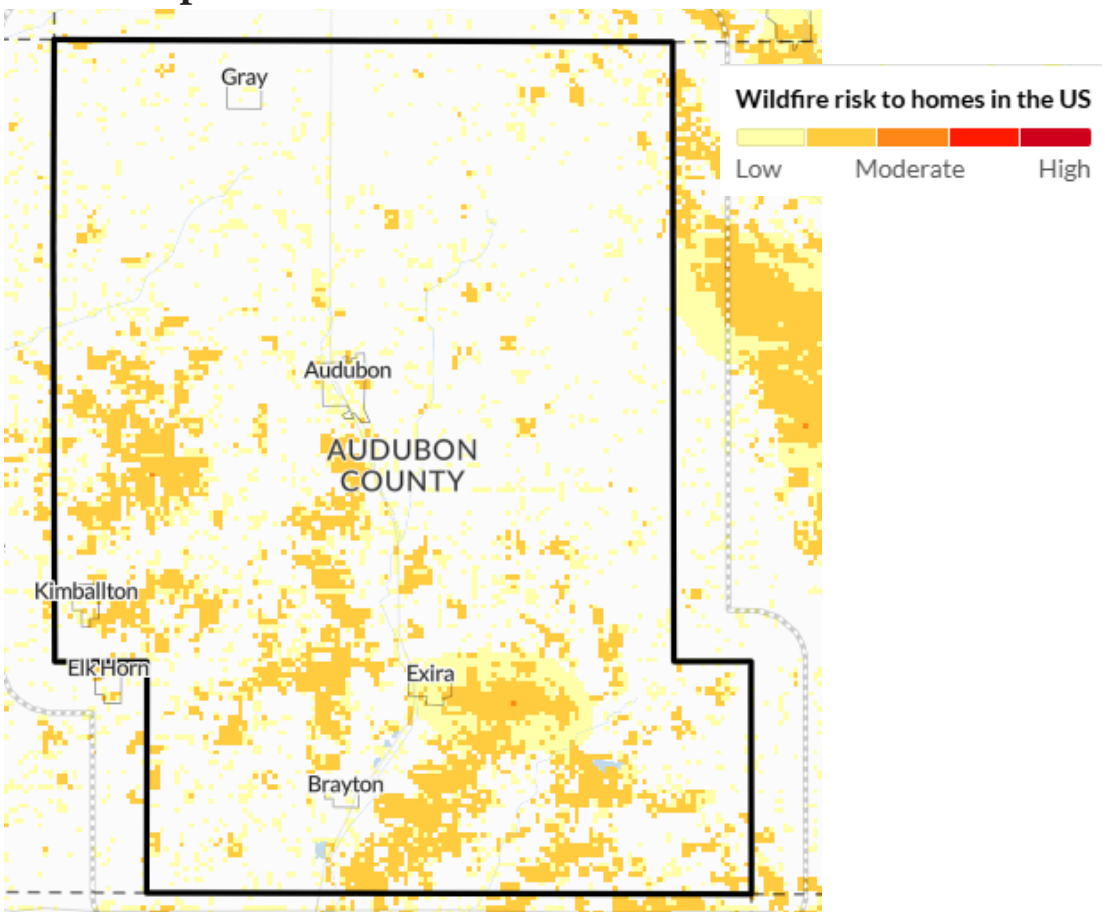
Mitigation actions to minimize the effect of grass and wildland fires can include:

- Proper training for first responders
- Ensure first responders have adequate equipment to fight fires
- Education of citizens on preparedness and reaction prior to and during a wildfire

Map 3.3: Wildfire Likelihood



Map 3.4: Wildfire Risk to Homes



Human Disease

This hazard includes a medical, health, or sanitation threat to the general public, such as a contamination, epidemics, plagues, insect infestations, and pandemics. Public health action to control infectious disease in the 21st century is based on the 19th century discovery of microorganisms as the cause of many serious diseases (e.g., cholera and Tuberculosis). Disease control resulted from improvements in sanitation and hygiene, the discovery of antibiotics, and the implementation of universal childhood vaccination programs. Scientific and technologic advances played a major role in each of these areas and are the foundation for today's disease surveillance and control systems. Scientific findings have contributed to a new understanding of the evolving relationship between humans and microbes (Iowa Hazard Mitigation Plan 2023).

Prior to 2020, this hazard was not at the forefront of the public view. That is until the COVID-19 pandemic hit worldwide. This pandemic caused major disruptions within the healthcare fields, society, and economies at all levels. To this day, the effects that the COVID-19 pandemic had on the world are still being felt.

The Iowa Department of Public Health tracks epidemiological statistics in Iowa. Public health agencies work to protect Iowans from infectious diseases and preserve the health and safety of Iowans through disease surveillance, investigation of suspect outbreaks, education, and consultation to county, local, and health agencies. As of 2013, 67 infectious diseases were designated as notifiable at the national level. A notifiable disease is one for which regular, frequent, and time information regarding individual cases is considered necessary for the prevention and control of the disease.

A pandemic human disease is defined as a disease that has spread around the world to many people. The word "pandemic" means occurring over a wide geographic area and affecting an exceptionally high proportion of the population (Merriam-Webster Dictionary). Some examples of pandemic diseases, past and present, include Tuberculosis, Polio, HIV/AIDS, SARS, and Influenza. Response and recovery to a pandemic disease will likely be lengthy.

The COVID-19 pandemic started in China in 2019 and by early 2020 the United States declared an emergency. This pandemic led to quarantine and social-distancing. Individualized responses happened on a jurisdiction by jurisdiction case with some jurisdictions implementing the public to "stay at home," some jurisdictions restricting large gatherings, closing schools and daycares, closing local bars and restaurants, requiring masks and some even required vaccines. The United States officially declared the end of the pandemic incident period on May 11, 2023. The COVID-19 pandemic triggered multiple declarations within the state and nation. The two declarations in Iowa were EM-3480-IA and DR-4483-IA. Under DR-4483-IA both individuals and public assistance was available for the public to utilize. This DR designation allowed $30,857,350.22 of Individual and Household Program dollars to be approved, $278,916,181.53 of Public Assistance grant Dollars to be obligated and $11,864,979.19 obligated to the Hazard Mitigation Grant Program. The EM-3480-IA declaration supplemented the state and local efforts in providing emergency services, such as the protection of lives, property, public health, and safety, or to lessen or avert the threat of a catastrophe in any part of the United States.

In Audubon County, from the onset of the pandemic to October 2, 2023, there were 1,299 cases of COVID-19 reported with 24 deaths being related to the pandemic.

There have been two cases of measles in Iowa in 2019, since then, however, there have been no additional cases reported. Prior to 2019, there were no cases reported since 2011. Since 2018, there have been 37 cases of mumps in Iowa. Prior to that, a statewide Mumps outbreak began in the summer of 2015 and lasted throughout 2017, causing over 1,200 confirmed cases of the disease (Iowa Department of Public Health).

The COVID-19 pandemic brought human disease back to the forefront of the public eye and reminded Iowans that they are not exempt from disease outbreaks. Audubon County experienced the effects of the pandemic and forced jurisdictions to react and be proactive to the ever-changing guidelines. While another pandemic of the COVID-19 magnitude may not happen in the near future, there are other diseases that effect the counties on a regular basis and lessons learned from the pandemic may be beneficial when looking to mitigate the effects of all human disease. It is likely that the county will face some form of human disease during the life of this plan. Some mitigation actions that jurisdictions can consider include:

- Create plans to disseminate accurate information on a regular basis
- Create plans to mitigate the spread of disease (quarantine, improved personal hygiene)
- Work with the public to ensure that the jurisdiction still can provide necessary services

River Flooding

A river flood occurs when water levels rise due to heavy rains, persistent thunderstorms over the same area for extended periods of time, snow melt, ice jams, or dam/levee breakage. Other factors that contribute to flooding include topography, soil conditions, and ground cover. Flooding may impact an area with only a few inches of water or cover entire houses, it could last a couple days or carry on for several weeks. As much as 90% of the damage related to all natural disasters (excluding droughts) is caused by flooding and associated debris flow. On average, flooding causes more than $2 billion in property damage each year.

Flooding is the most common of all natural hazards- it occurs in every U.S. state and territory and is a threat experienced anywhere in the world that receives rain. From 1983-2012, floods in the United States have killed more people than tornadoes, hurricanes, or lightning. Since 1900, flooding has caused more than 10,000 deaths, and though numbers can fluctuate from year to year, the thirty-year national average is 89. It is believed that many people underestimate the power and force of water; six inches of fast moving water can knock a person off their feet, twenty-four inches can carry away most automobiles.

Between 2019 and 2024, Audubon County experienced only one reported flood on March 15, 2019. It happened near the city of Gray. Flooding lasted from the 13th through the 19th with the majority of the flooding happening on March 15. This flooding is due to excessive snow melt and moderate rainfall. This event resulted in $100,000 of property damage.

Climate change is anticipated to increase the number of river floods that impact the planning area. Precipitation is expected to increase in intensity, but may not increase in frequency. Average annual precipitation is anticipated to increase 1" to 4" by 2050, but heavy precipitation events are likely to be more common.

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to mitigate future flood loses. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs caused by floods. The flood insurance is offered to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities must agree to adopt and enforce ordinances to reduce the risk of flooding. The cities of Audubon, Brayton, Exira, Gray and Kimballton participate in the NFIP while Audubon County does not. Each participating and non-participating jurisdiction's flood maps can be found in their respective appendix of this document.

The National Weather Service provides flood forecasts for the State of Iowa. Local National Weather Service forecast offices issue flood watches 12-36 hours in advance of a possible flood. Warnings are issued when river flooding is occurring or imminent.

The report Climate Change Impacts on Iowa 2010 ("Report") notes that there is a trend toward more frequent intense rainfall events. If this trend continues, flash flooding events and their associated impacts will likely

occur more often in Iowa. As for riverine flooding, very heavy precipitation does not always result in flooding, but it can when the very heavy precipitation occurs frequently without enough time for the watershed to drain properly. The impact of these climate changes in Iowa may be impacting eastern Iowa more than the rest of the state. Audubon County has portions of the county that are susceptible to river flooding and it is likely that at least one portion of the county will experience river flooding through the life of this plan. With each county experiencing one flood within the five years, this hazard requires attention from the county with that attention focused on the flood prone areas. Reducing the impacts of flooding can reduce the impacts on the population, crops, and property.

Mitigation actions to minimize the effect of river flooding can include:

- Implement the "watershed approach" for flood reduction when appropriate.
- Get all jurisdictions within the two counties to participate in NFIP
- Create plans which limit construction within floodplains
- Elevate or protect wastewater lift stations
- Put in impervious manholes, pumps, or backflow prevention, or similar small-scale flood protection projects
- Promote the implementation of green infrastructure
- Educate the public about flood preparation and response
- Reduce erosion and flooding through riverbank improvement projects

Severe Winter Storms

Every year, winter weather kills hundreds of people in the United States, primarily from automobile accidents, overexertion, or exposure. Severe winter storm events can include blizzard conditions, heavy snow, blowing snow, freezing rain, heavy sleet, and extreme cold. They are most common from the months of October to April.

The various types of severe winter weather can cause considerable damage. Heavy snow can immobilize transportation systems, down trees and power lines, collapse buildings, and lead to the loss of livestock and wildlife. Loose snow begins to drift when wind speed reaches 9-10 mph under freezing conditions. The potential for drifting is substantially higher in open country than urban areas where buildings, trees, and other features obstruct the wind. Ice storms have resulted in fallen trees, broken tree limbs, downed power lines and utility poles, fallen communications towers, and impassable transportation routes. Severe ice storms have caused total electric power outages over large areas of Iowa and rendered assistance unavailable to those in need due to impassible roads. Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life threatening. Table 3.8 displays the definitions for severe winter storms.

Table 3.8: Severe Winter Storm Definitions

Blizzard	Sustained or frequent winds of 35 mph or greater; falling and/or blowing snow that frequently reduces visibility to 1/4 of a mile or less; conditions are expected to last for a minimum of three hours
Frost/Freeze	Frost describes the formation of thin ice crystals on the ground or other surfaces in the form of scales, needles, feathers, or fans. Frost develops under conditions similar to dew, except the temperatures of the Earth's surface and earthbound objects falls below 32°F. A freeze is when the surface air temperature is expected to be 32°F or below over a widespread area for a climatologically significant period of time. Use of the term is usually restricted to advective situations or to occasions when wind or other conditions prevent frost. The National Oceanic and Atmosphereic Administration groups these two events together when recording data.

Heavy Snow	4" or more of snow in 12 hours or less, 6" or more of snow in 24 hours or less
Ice Storm	Damaging accumulations of more than 1/4" of ice are expected during freezing rain
Sleet Storm	Pellets of ice composed of frozen or mostly frozen raindrops; these pellets cause slippery surfaces. Heavy sleet is a relatively rare occurrence defined as an accumulation of sleet covering the ground to a depth of 1/2" or more
Extreme Cold/ Wind Chill	Temperatures at or below 0 degrees Fahrenheit and wind chill temperatures at -25 degrees Fahrenheit for at least three hours is considered extreme cold. Wind chill is not the actual temperature, but rather how wind and cold feel on exposed skin.
Winter Storm Event	A combination of heavy snow, blowing snow, and/or dangerous wind chills that can lead to hazardous conditions and potential disruptions.

Between 2019 and 2024, Audubon County experienced fourteen severe winter storm events: three blizzards, one heavy snow, two frost/freezes, three extreme cold/wind chill events, and five winter storm events, meaning that more than one significant hazard met or exceeded locally defined warning criteria. Any jurisdiction in the planning area may experience any level of any of the severities outlined in table 3.8 above, with more severe events being less likely than milder events.

Bridges and overpasses are particularly dangerous because they freeze before other structures. This, along with heavy snow, can cause hazardous conditions that can slow or stop the flow of supplies as well as disrupt emergency and medical services.

Audubon County experiences several instances of severe winter storms each year and it is highly likely that the county will experience at least one severe winter storm annually throughout the life of this plan. Some of these events cause reported damage, but the majority do not. The economic impact of winter weather each year is huge, with costs of snow removal, damage repairs, and loss of business in the millions. So while the severe winter storm events in Audubon County caused no reported damage, these hazard instances cost the local jurisdictions money to remove the snow and ice these hazard caused. Each jurisdiction spends numerous hours planning for snow removal and emergency service response during these events. While there is little that can be done to prevent these events, jurisdictions continue to strive for a quick and efficient response that will reduce costs to taxpayers.

Mitigation actions to minimize the effect of severe winter storms can include:

- Electric utility retrofit/hardening
- Encourage the use of NOAA radios
- Purchase and installation of back-up electrical generation
- Educate the population about carbon monoxide and its dangers and ways to reduce the potential for carbon monoxide poisoning

Thunderstorm/Lightning/Hail

The National Weather Service has developed effective weather advisories that are widely distributed. Accurate information is made available hours in advance if a severe winter storm is threatening an area. A winter storm can range from a heavy snow over a few hours to blizzard conditions that last several days.

A thunderstorm is a rain shower during which thunder occurs. Since thunder comes from lightning, all thunderstorms have lightning. Most thunderstorms are 15 miles in diameter and last an average of 30 minutes. A thunderstorm is classified as "severe" when it contains one or more of the following:

- Hail three-quarter inch or greater
- Winds gusting in excess of 57.5 mph
- Tornado

There are about 100,000 thunderstorms each year in the United States and approximately 10% of those results in severe thunderstorms. Severe thunderstorms are found most often from Texas to Southern Minnesota. Thunderstorms are common in the spring and summer months, and during the afternoon and evening hours. However, thunderstorms can occur year-round and at all hours.

There are four types of thunderstorms: single cell, multi-cell cluster, multi-cell line, and supercell.

Single Cell

Single cell thunderstorms typically last less than 30 minutes and are not usually severe; however, it is possible for a single cell storm to produce a brief severe weather event with heavy rainfall and occasionally a weak tornado.

Multi-Cell Cluster

Multi-cell cluster thunderstorms are the most common type of thunderstorm. The multi-cell cluster consists of multiple cells, moving along as one unit, with each cell in a different phase of the thunderstorm life cycle. It can produce moderate size hail, flash floods, and weak tornadoes. While to multi-cell cluster may last for several hours, each cell in a multi-cell cluster only lasts about 20 minutes.

Multi-Cell Line

Multi-cell line thunderstorms consists of a long line of storms with a continuous well-developed gust front at the leading edge of the line. The line of storms can be solid, or there can be gaps and breaks in the line. These thunderstorms can produce hail up to golf-ball size, heavy rainfall, and weak tornadoes, but they are best known to produce strong downdrafts.

Supercell

Supercell thunderstorms are rare, but highly organized and pose a high threat to life and property. A supercell thunderstorm is similar to a single-cell thunderstorm because they both have one main updraft. The difference is that the updraft of a supercell is extremely strong, reaching speeds of 150-175 mph. It is set apart from the other thunderstorm types due to the presence of rotation. The rotating updraft of a supercell thunderstorm helps it to produce extreme severe weather threats, such as giant hail (more than two inches in diameter), strong downbursts of 80 mph or more, and strong to violent tornadoes. The leading edge of a supercell is usually light rain as heavier rain tends to fall closer to the updraft with severe weather typically forming towards the rear of the storm.

Unlike other weather hazards that often involve sophisticated watches and warnings from the National Weather Service, lightning can occur anywhere there is a thunderstorm. It is one of the most underrated severe weather hazards, yet ranks as one of the top weather killers in the United States. According to the National Weather Service, from 2008-2017, lightening killed an average of thirty-one people each year, with hundreds of documented injuries. It is estimated that lightening causes more than one billion dollars in damage each year.

There are three types of lightening: ground flashes, cloud-to-ground, and cloud flashes

Ground Flashes

Natural ground flashes occur because of normal electrification in the environment while artificially initiated lightning occurs because of strikes to very tall structures, airplanes, and towers. Natural lightning travels from the cloud to the ground; artificially initiated lightning travels from the ground to the cloud.

Cloud-to-Ground

Cloud-to-ground lightning is the result of a step leader, a channel of negative charge, traveling downward through the cloud. As it nears the ground, the negatively charged step leader is attracted to a channel of positive charge, called a streamer, normally through something tall such as a tree, house, or telephone pole. When the leader and streamer connect, a powerful electrical current begins flowing, resulting in a flash of lightning.

Cloud Flashes

Cloud flashes sometimes have visible channels that extend out into the air and around the storm, but they do not strike the ground. A related term for cloud flashes is heat lightning.

The lightning rate peaks in the summer months, specifically July, with rapid increase during May and rapid decrease in September. Most lightning occurs during the afternoon or early evening. Besides causing injury and death, a lightning strike can result in extensive property damage by sparking a fire or surging through the electrical circulatory of a home or business. Damage to the emergency management center may affect warning systems, communications equipment, and computer systems.

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. There is no clear distinction between storms that do and do not produce hailstorms. Nearly all severe thunderstorms produce hail, though it may melt before reaching the ground. Hailstorms can have layers like an onion if they travel up and down in an updraft, or they can have no layers if they are "balanced" in an updraft. One can tell how many times a hailstone traveled to the top of a storm by counting the layers. Drops of super-cooled water hit the ice and freeze on it, causing it to grow. Hail falls when it becomes heavy enough to overcome the strength of the updraft and is pulled by gravity towards earth.

Hail size is estimated by comparing it to a known object. Most hail storms are made up of a mix of sizes, and only the very largest hail stones pose serious risk to people caught in the open. Hail that is quarter size (one inch) or larger is considered severe. The stronger the thunderstorm updraft, the larger the hailstone can grow. The largest hailstone recovered in the United States fell in Vivian, South Dakota on June 23, 2010, with a diameter of 8 inches and a circumference of 18.62 inches. It weighed one pound and fifteen ounces.

Damage from hail approaches $1 billion in the United States annually and most of the damage is to crops. Crops are particularly vulnerable and even relatively small hail can destroy them in a matter of minutes. Vehicles, roofs, buildings, homes, and landscaping are other things that are most commonly damaged by hail. Hail only rarely results in loss of life directly, although injuries can occur.

Data collected from the National Climatic Data Center (NCDC) shows that Iowa experiences many thunderstorm and lightning events every year. Between 2019 and 2024 in Audubon County, there were 20 days with thunderstorm/lightning/hail instances. There were eight days with hail reported, and twelve with thunderstorm wind reported. These storms resulted in a total of $15,000 in property damage and $50,000 in crop damage.

Between 1997 and 2012, Iowa experienced, on average, 628,511 cloud-to-ground flashes per year. This ranks Iowa fifteenth nationally in terms of cloud-to-ground flash densities with 11.1 flashes per square mile. From 1959-2011, Iowa experienced 72 fatalities due to lightning (Vaisasla). Iowa's last reported lightning fatality was in 2008. Lightning injures more people than it kills and leaves some victims with life-long health problems.

Some thunderstorms can been seen approaching, while others hit without warning. The National Weather Service usually issues severe thunderstorm watches a few hours before the storm hits an area, but an area may only have minutes after a warning is issued. Most single-cell thunderstorms are 15 miles in diameter and last an average of 30 minutes. However, multi-cell cluster thunderstorms are the most common type of thunderstorm and can last several hours.

Audubon County is extremely likely to experience thunderstorms/lighting/hail during the planning period. Thunderstorms are not restricted by jurisdictional boundaries, therefore the entire county can be impacted by one event. Research indicates that these the county is likely to expect two to four hailstorms annually. This hazard typically does not cause harm to property, crops, and people, but can cause reported damage to all. Instances of these hazard events has increased due to climate change. Warming summers and higher quantities of water in the atmosphere will likely fuel increased thunderstorm development.

Due to storms occurring on December 15, 2022, Audubon County was included in a Proclamation of Disaster Emergency. This declared State of Disaster Emergency included forty-three counties. It also activated the disaster response and recovery aspects of the Iowa Department of Homeland Security and Emergency Management's Iowa Emergency Response Plan and authorized the use and deployment of all available state resources, supplies, equipment, and materials as reasonably necessary to assist the impacted citizens.

Based on information collected from FEMA for the Iowa Hazard Mitigation Plan, Audubon County is categorized as experiencing relatively low hail expected annual loss and very low lightning expected annual loss. Both people and property are vulnerable to this hazard and mitigation actions should be implemented to reduce the overall vulnerability of the counties.

Mitigation actions to minimize the effects of thunderstorms/lighting/hail may include:

- Encourage the use of NOAA weather radios
- Construct shelters or safe rooms at public locations where there people gather
- Provide education on how to respond to thunderstorm events, especially if they are not at home
- Electric system hardening, including putting electric systems underground

Tornado

Tornadoes are the most violent of all atmospheric storms. A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. The funnel is made visible by dust and debris sucked up and condensation of water droplets in the center of the funnel.

There are two types of tornadoes: those that come from the supercell thunderstorm and those that do not. Tornadoes that form from a supercell thunderstorm are most common, and often are the most dangerous. In a supercell, the tornado is a very small extension of a larger rotation that can be as large as ten miles in diameter and up to 50,000 feet fall. Field studies show that as few as 20% of all supercell thunderstorms produce tornadoes. Non-supercell tornadoes are circulations that form without a rotating updraft. One type of non-supercell tornado is the gustnado. A gustnado tornado has a whirl of dust and/or debris at or near the ground with no condensation funnel. Another non-supercell tornado is a landspout. A landspout tornado is a narrow, rope-like condensation funnel that forms when the thunderstorm cloud is still growing and has no rotating updraft, instead the spinning motion originates near the ground. Waterspouts are similar to landspouts, except they occur over water. Damage from non-supercell tornadoes tends to be F2 or less.

The Enhanced Fujita Scale (EF-Scale) replaced the Fujita Scale on February 1, 2007. The EF Scale addresses some of the Fujita Scale limitations identified by meteorologists and engineers. The EF Scale is still a set of wind estimates, not measurements, based on damage. The original Fujita Scale lumped together homes, schools, mobile homes, vehicles, and trees in one short description of damage for each F-Scale category.

In the EF-Scale, detailed descriptions are given for examples of damage to twenty-three types of buildings, taking into account types of buildings, construction quality and maintenance, and five additional objects like trees, towers, and poles. Wind speed estimates are then provided for each structure and type of damage (www.weather.com). Table 3.9 shows the estimated wind speed for the Enhanced Fujita Scale, as well as the expected damage associated with the tornado's intensity. Table 3.10 displays the relationship between tornado strength and associated damages.

Table 3.9: Tornado Ratings and Expected Damage

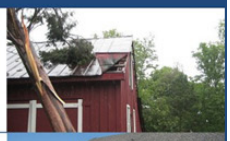
EF Rating	Wind Speeds	Expected Damage		
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.		
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.		
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.		
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.		
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.		
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.		

Table 3.10: Tornado Facts

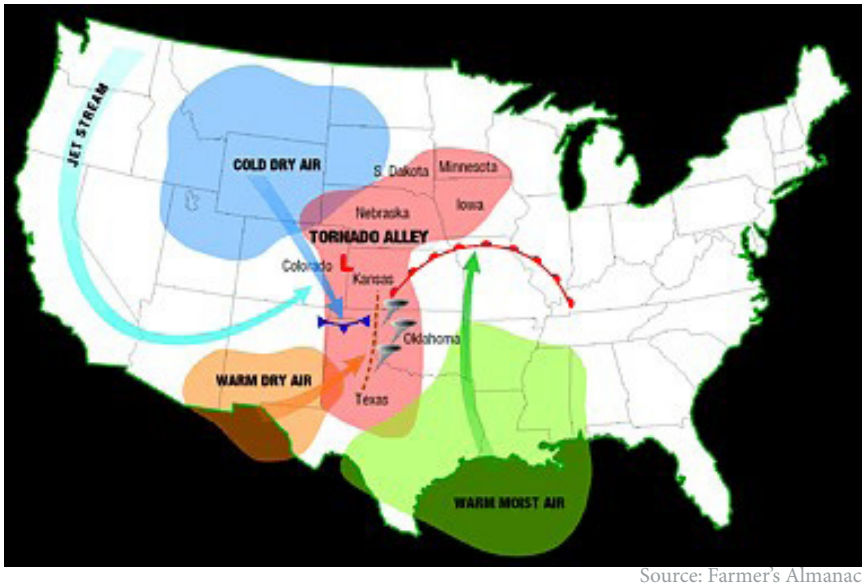
Weak Tornadoes (EF0 and EF1)	Strong Tornadoes (EF2 and EF3)	Violent Tornadoes (EF4 and EF5)
88% of all tornadoes	11% of all tornadoes	1% of all tornadoes
Less than 5% of all tornado deaths	Nearly 30% of all tornado deaths	70% of all tornado deaths
Lasts 1-10+ minutes	May last 20 minutes or longer	Can exceed 1 hour
Light to moderate damage	Considerable to severe damage	Devastating to incredible damage

Approximately 1,000 tornadoes hit the nation yearly, killing an average of 60 people per year—mostly from flying or falling debris. The peak tornado season for the northern plains and upper Midwest is in June or July. Most tornadoes occur between 3 pm and 9 pm; however, it is important to remember that they can happen at all hours of the day and any day of the year.

Tornado Alley is a nickname given to the area of the United States that consistently experiences a high frequency of tornadoes each year. The relatively flat land in the Great Plains allows cold, dry, polar air from Canada to meet warm, moist, tropical air from the Gulf of Mexico. A large number of tornadoes form when these two air masses meet. Figure 3.4 depicts the warm and cold air masses, as well as Tornado Alley.

https://mgtvwrbl.files.wordpress.com/2016/01/ef-ratings.jpg

Figure 3.4: Air Masses and Tornado Alley



Source: Farmer's Almanac

According to the National Climatic Data Center, there have been three tornadoes in Audubon County from 2019 to 2024. One tornado was categorized as EF0, and the other two were categorized as EF1. The three tornadoes caused $135,000 in property damage and no crop damage. These tornadoes caused no fatalities or injuries. The maps on the following page show the approximate path and information for the Audubon County tornadoes. As shown in the maps, tornadoes are not boundary driven and can impact any and all of the county.

Advancement in weather forecasting has allowed tornado watches to be delivered up to hours in advance. However, the best lead-time for a specific severe storm and tornado is about thirty minutes. Tornadoes can develop and change paths rapidly, limiting the warning time. They can last from several seconds to over an hour, though most tornadoes last about five minutes. The tornadoes from 2019 to 2024 were not the cause for any disaster declarations. From 2019 to 2024, tornadoes in Audubon County lasted an average of nine minutes.

Audubon County is highly likely to expierence tornado events within the five year planning period of this plan. Nationally, reports show that the overall number of tornadoes reported annually has increased. Although there have been advancements in the predictability of the events, the warning time is still limited putting people and property at a high risk of damage. Damage to the economy can continue to happen even after the weather event has ended. Damage caused by tornadoes can cause counties, cities, and the public large amounts to clean up the damage, get streets opened back up, and utilities back up and running. Educating the public about tornadoes and what to do in the event of one occurring can be a mitigation effort that can save lives.

Climate change's impact on tornadoes is uncertain. The intensity and frequency do not appear to be changing, although evidence suggests that "tornado alley" is shifting east. The likelihood of a tornado in Iowa has not significantly shifted, but as temperatures rise, the length of tornado season may increase.

Mitigation actions to minimize the effects of tornadoes may include:

- Encourage the use of NOAA weather radios
- Construct shelters or safe rooms
- Installation of storm sirens
- Electric system hardening, including putting electric systems underground
- Adoption and enforcement of higher building standards with the jurisdictions

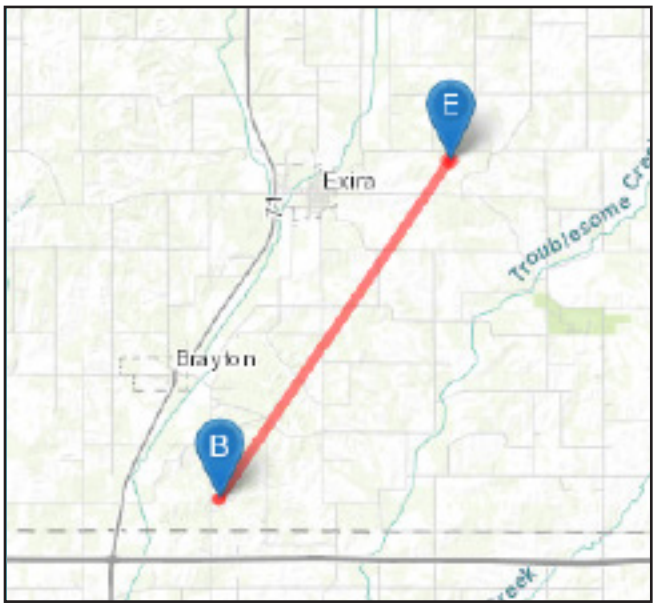
Map 3.5: Audubon County EF1 Tornado 12-15-2021

Starting location: 4 SW BRAYTON
12/15/2021 16:59 CST-6
Ending location: 3 E HAMLIN
12/15/2021 17:09 CST-6
Scale: EF1, Width: 100 Yards, Length: 13.4 Miles
Property Damage: $50,000 Crop Damage $0

Map 3.6: Audubon County EF1 Tornado 12-15-2021

Starting location: 4 SE BRAYTON
12/15/202117:01 CST-6
Ending location: 3 SSW GARDNER
12/15/2021 17:09 CST-6
Scale: EF1, Width: 80 Yards, Length: 10.15 Miles
Property Damage: $75,000 Crop Damage $0

Map 3.7: Audubon County EF0 Tornado 5-21-2024



Starting location: 3 SSE BRAYTON
5/21/2024 14:09 CST-6
Ending location: 3 ENE EXIRA
5/21/2024 14:18 CST-6
Scale: EF0, Width: 100 Yards, Length: 7.24 Miles
Property Damage: $10,000 Crop Damage $0

Windstorm

Damaging winds are classified as those exceeding 50-60 mph. Damage from severe thunderstorm winds account for half of all severe reports in the lower forty-eight states and are more common than damage from tornadoes. According to the majority of Storm Prediction Center forecasts, severe wind is the most difficult threat to forecast because they come from a wider range of environments than just supercells, tornadoes, or large hail. Damaging wind events can develop with little advanced warning as they can occur on their own, with severe winter storms, or with severe thunderstorms.

There are several types of damaging winds: straight-line, downdrafts, downbursts, microbursts, gust front, derecho, and bow echo.

Straight-Line

Straight-line winds are any thunderstorm wind that is not associated with rotation and is used mainly to differentiate from tornadic winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.

Downdrafts

Downdrafts are a small-scale column of air that rapidly sinks towards the ground.

Downbursts

Downbursts are strong downdrafts with horizontal dimensions larger than 2.5 miles, resulting in an outward burst of wind on or near the ground. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.

Microbursts

Microbursts are small, concentrated downbursts that produce an outward burst of damaging winds at the surface. Microbursts are generally small (less than 2.5 miles) and short-lived, lasting only five to ten minutes.

Gust Front

A gust front wind is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm.

Derecho

A derecho wind is a widespread thunderstorm wind event caused when new thunderstorms form along the leading edge of an outflow boundary. The thunderstorms feed on this boundary and continue to reproduce themselves. Derechos typically occur in the summer months when complexes of thunderstorms form over the plains and northern plains states. Usually these thunderstorms produce heavy rain and severe wind, as they can last a long time and cover such large areas.

Bow Echo

A bow echo wind is a radar echo which is linear but bent outward in a bow shape. Damaging straight-line winds often occur near the "crest" or center of a bow echo. Bow echo winds can be over 186 miles in length, last for several hours, and produce extensive wind damage at the ground.

Microbursts and downbursts are very dangerous to aviation. They are known for their ability to produce wind shears which can slow airspeed and cause aircrafts to lose altitude at a very critical time for flight near the ground. A plane will encounter strong headwinds followed by strong tailwinds as it enters and flies through a microburst. Great strides have been made in understanding and avoiding the risk from low altitude wind shears. Major airports routinely use Terminal Doppler Weather Radars, developed during the 1990s. These radars pay particular attention to weather conditions occurring within a few miles of the airport, especially conditions that might cause deadly microbursts.

From 2019-2024, Audubon County experienced two recorded high wind events. The first wind event was a derecho which occurred on December 15, 2021 and was the first-ever December derecho in the United States. This derecho was accompanied by 63 confirmed tornadoes. During this event, gusts were reported over 70 miles per hour throughout most of the affected area, and in some areas, wind gusts were recorded at over 80 miles per hour. This weather event did not cause any reported damage within Audubon County. This event triggered the disaster designation of DR-4642-IA to be declared on February 23, 2022. The declaration obligated $252,342 for emergency work and $3,946,830 in permanent work. It also obligated $861,231 in hazard mitigation assistance.

The other high wind episode in Audubon County occurred on April 23, 2023 where wind gusts were reported over 60 miles per hour. This episode caused no reported damage within the county.

Damaging winds can develop with little advanced warning and can impact the entire county at one time. Winds are not stopped by jurisdictional boundaries and therefore can impact large areas during one event. The National Weather Service has developed a windstorm warning system similar to other events such as tornadoes, winter storms, and thunderstorms, and watches are issued when conditions are favorable. Advisories are issued when sustained winds of 31 to 39 mph are expected to last for three hours or longer, or when there are wind gusts of 46 to 57 mph. Windstorm warnings are issued when there are sustained winds of 40 mph or greater for one hour or more, or when there are wind gusts of 58 mph or greater for one hour or more. Windstorm watches are generally delivered hours in advance, but the best warning lead-time for a specific storm is about 30 minutes.

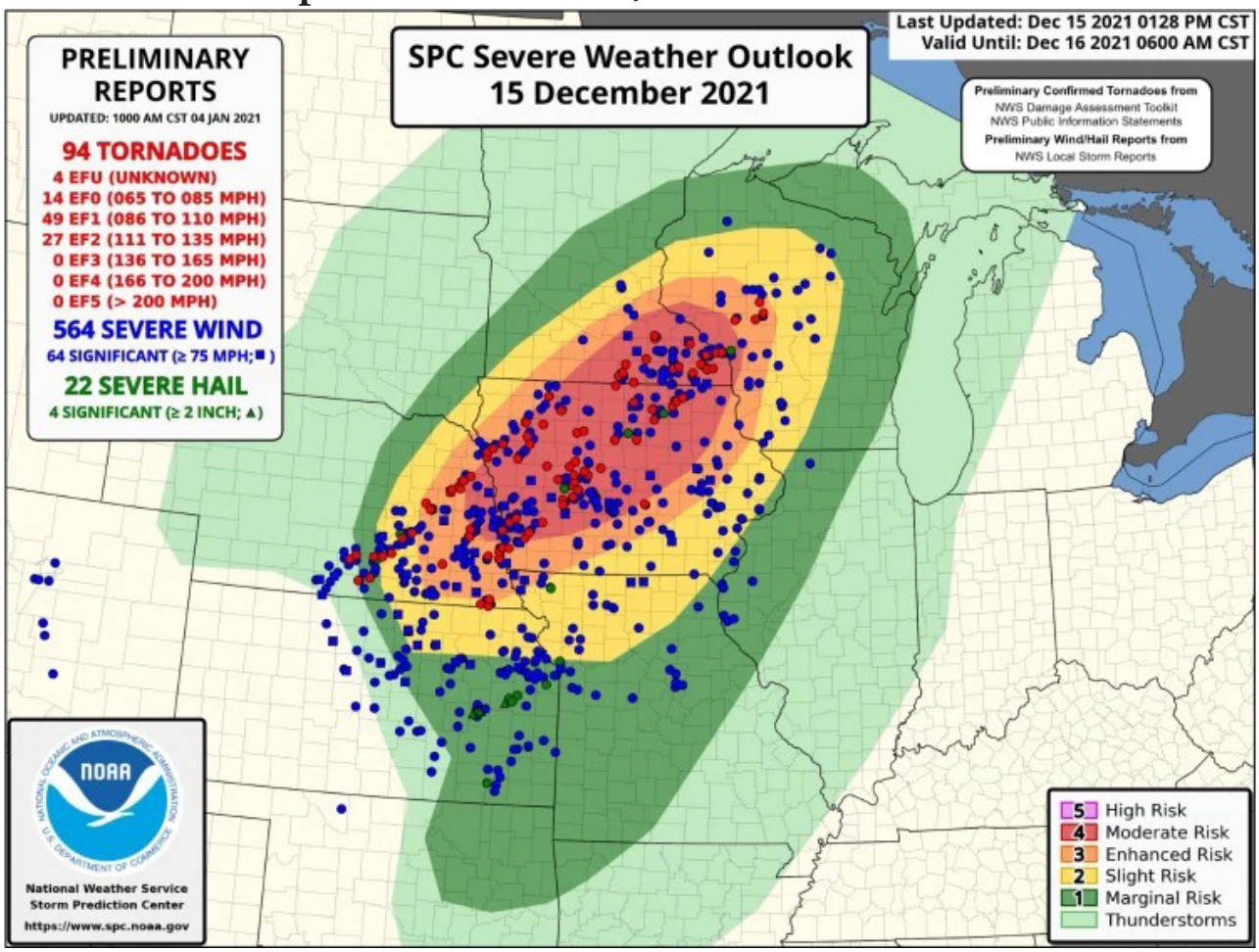
Audubon County is likely to experience windstorms over this planning period. Those most at risk during windstorms include people in mobile homes, at campgrounds, or at other dwellings without secure foundations. Windstorms may have a destructive path that is tens of miles wide and the duration could range from hours to days. Damages can include broken tree branches, roof damage, broken windows, or crop damage. There are a number of projects each jurisdiction can undertake to improve the safety for the residents and protection of property during a windstorm.

Climate change's impact on windstorms in Audubon County and Iowa is uncertain. The intensity and frequency do not appear to be changing. The likelihood of a windstorm impacting the planning area has not significantly shifted, but as temperatures rise, the length of the severe weather season may increase.

Some of the mitigation actions that jurisdictions can implement to reduce the impact of a windstorm include:

- Encourage the use of NOAA weather radios
- Construct shelters or safe rooms
- Installation of storm sirens
- Electricity hardening/under grounding
- Purchase and installation of backup generators for critical facilities
- Develop and enforce building codes

Map 3.8: December 15, 2021 Weather Events



Combination Hazards

HAZMAT Incident

A hazardous material is one that may cause damage to persons, property, or the environment when released to soil, water, or air. Hazardous materials are categorized as toxic, corrosive, flammable, irritant, or explosive. They can pose a risk to life, health, or property, possibly requiring evacuation, a hazardous material incident can occur at a fixed location, in pipeline transportation, or while transporting hazardous materials.

A fixed hazardous materials incident is the accidental release of chemical substances or mixtures, which presents a danger to public health or safety during production or handling at a fixed facility. Chemicals are manufactured and used in every-increasing types and quantities- each year over 1,000 new synthetic chemicals are introduced and as many as 500,000 products pose physical or health hazards and can be defined as hazardous chemicals. Hazardous material incidents generally affect a localized area and the use of planning and zoning can minimize the area of impact.

A pipeline transportation incident occurs when a break in a pipeline creates the potential for an explosion or leak of a dangerous substance (oil, gas, etc.) possibly requiring evacuation. An underground pipeline incident can be caused by environmental disruption, accidental damage, or sabotage. Incidents can range from a small, slow leak to a large rupture where an explosion is possible. Inspection and maintenance of the pipeline system, along with marked gas line locations, and an early warning and response procedure can lessen the risk to those near the pipelines.

A hazardous materials transportation incident constitutes an accidental release of chemical substances or mixtures that presents a danger to public health or safety during transportation. Large quantities of hazardous materials are transported daily on Iowa's streets, highways, interstates, and railways. The DOT regulates the routes and speed limits used by carriers an monitor the types of hazardous materials crossing state lines. More and more potentially hazardous materials are being used in commercial, agricultural, and domestic uses, and are being transported on roadways and railways (Iowa Hazard Mitigation Plan 2023).

The State of Iowa requires any person manufacturing, storing, handling, transporting, or disposing of a hazardous substance to notify the department and local law enforcement of the occurrence of a hazardous condition. According to the Iowa Department of Natural Resources Hazardous Substance Database, Audubon County had 12 reported hazardous spills between 2018 and 2023. Of the 12 reported spills, 5 posed no threat to humans or the environment. There was one spill that threatened the surface water and 6 spills that threatened the soil.

While there were a large number of reported spills between 2018 and 2023, the committee based their probability score on the likelihood of a high impact spill occurring. A high impact spill is defined as an environmental emergency by the Environmental Protection Agency. An environmental emergency is a sudden threat to the public health or the well-being of the environment, arising from the release or potential release of oil, radioactive materials, or hazardous chemicals into the air, land, or water (Iowa Hazard Mitigation Plan 2023).

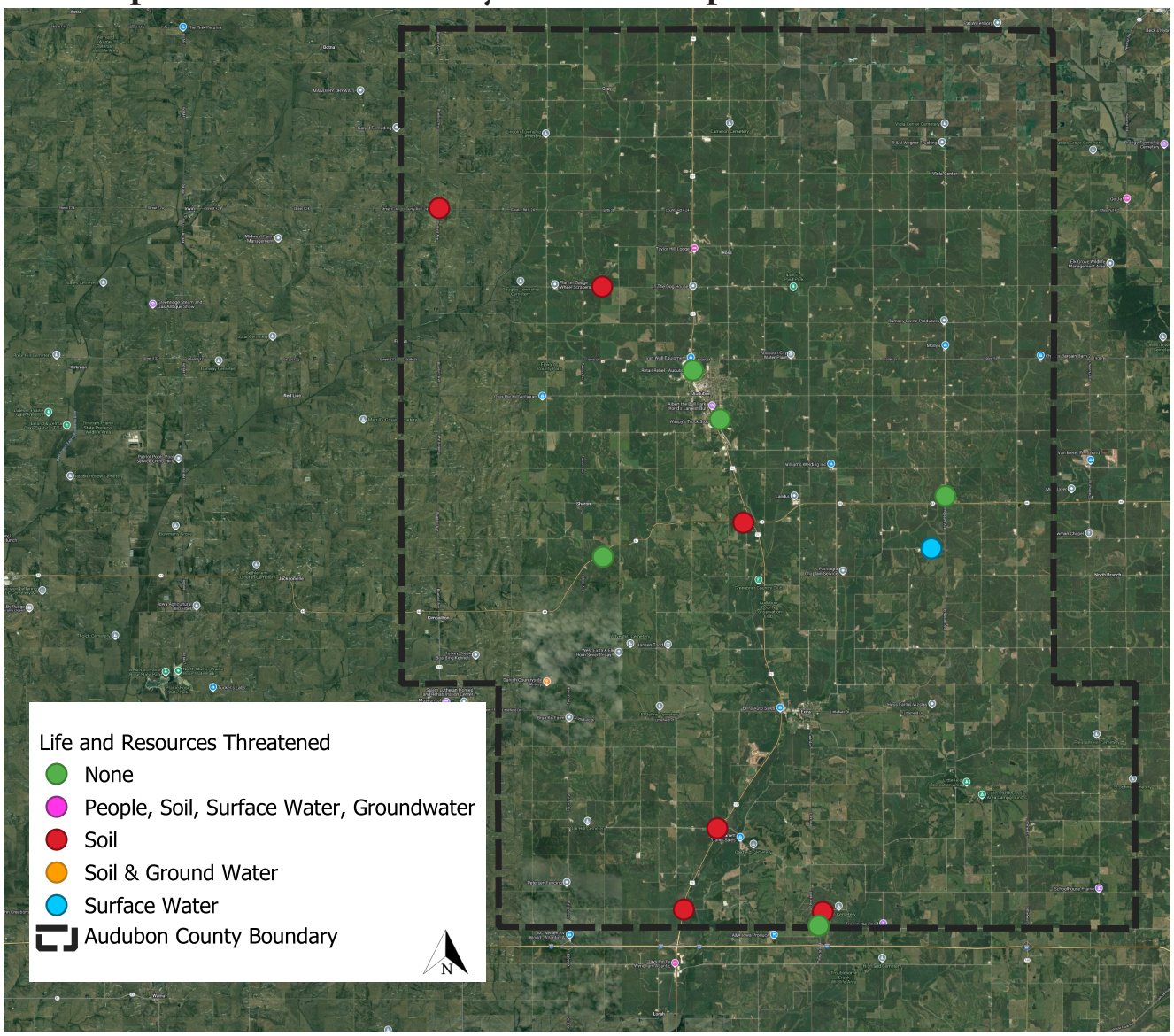
A hazardous material spill can occur almost anywhere and with little to no warning. Public address systems, television, radio, and the NOAA Weather Radios are used to disseminate emergency messages about hazardous material incidents. The following map displays where the spills occurred during 2018 and 2023 in Audubon County.

Hazardous Spills are a man-made hazard that while actions can be taken to reduce the number of spills and reduce the impact these spills have on the man-made and natural environment, it is unlikely that these spills will be completely eliminated. The map in this section show that these spills are most likely to occur on roadways with increased amounts of traffic and in areas where there are larger populations. In general, safeguards are increasing to reduce the impact spills have, but the amount of more potentially-hazardous materials that are used on a day-to-day basis is increasing. Audubon County is likely to experience and should anticipate a hazardous spill occurring and plan to respond in a quick and efficient manner if required.

Mitigation actions to minimize the effect of a Hazardous Materials Incident can include:

- Create or contract with a HAZMAT response team for incident response
- Encourage businesses to complete employee training, installation of containment systems, and regular maintenance and inspection of hazardous material storage and equipment

Map 3.9: Audubon County Hazardous Spill Locations 2018-2023



Infrastructure Failure

This hazard encompasses the following hazards: communications failure, energy failure, structural failure, and structural fire. This includes an extended interruption, widespread breakdown, or collapse (part or all) of any public or private infrastructure that threatens life and property.

Communications Failure

Communications failure is the widespread breakdown or disruption of normal communication capabilities. This could include major telephone outages, loss of local government radio facilities, and long-term interruption of electronic broadcast services. Emergency 911, law enforcement, fire, emergency medical services, public works, and emergency warning systems are just a few of the vital services which rely on communication systems to effectively protect citizens. Disruptions and failures can range from localized and temporary to widespread and long-term.

Energy Failure

An extended interruption of service either electric, petroleum, or natural gas, which by an actual or impending acute shortage of usable energy could create a potential health problem for the population and possibly mass panic. International events could affect supplies of energy producing products while local conditions could affect distribution of electricity, petroleum, or natural gas. The magnitude and frequency of energy shortages are associated with international markets. Local and state events such as ice storms can disrupt transportation and distribution systems. Stockpiles of energy products eliminate short disruptions but can increase the level of risk to the safety of people and property near the storage site.

Structural Failure

The collapse (all or part) of any public or private structure including roads, bridges, towers, and buildings is considered a structural failure. A road, bridge, or building may collapse due to the failure of the structural components or because the structure was overloaded. Natural events such as heavy snow may cause the roof of a building to collapse under the weight of the snow. Heavy rains and flooding can undercut and washout a road or bridge. The age of the structure is sometimes independent of the cause of the failure. Enforcement of building codes can better guarantee that structures are designed to hold-up under normal conditions, routine inspection of older structures may alert inspectors to "weak" points. The level of damage and severity of the failure is dependent on factors such as the size of the building or bridge, the number of occupants of the building, the time of day, day of week, amount of traffic on the road or bridge, and the type and amount of products stored in the structure (Iowa Hazard Mitigation Plan 2010).

Structural Fire

A structural fire is an uncontrolled fire in a populated area that threatens life, property, is beyond normal day-to-day response capability, and has the potential for large economic loses. Most structural fires occur in residential structures, but the occurrence of a fire in a commercial or industrial facility could affect more people and pose a greater threat to those near the fire or fighting the fire because of the volume or type of material involved.

No widespread communications failures have occurred in Iowa. Local incidents due to weather conditions, equipment failure, excavation incidents, and traffic accidents have been reported. The energy crisis of the 1970s had significant impacts on consumers in Iowa. High inflation and unemployment were associated with the dependence on foreign oil during that time. An energy shortage of that magnitude has not affected Iowa

since. There have been sporadic structural failures across the counties. Most have included homes, commercial structures, or communications towers. Structural fires occur occasionally and are quickly extinguished by local fire departments.

Most of the highly necessary communication systems have backup and redundant designs to provide continuity of service. Most communication failures would be limited to localized areas. They can have a negative impact on businesses that are dependent on the internet for servicing and communicating with customers. Communication failures can hamper emergency response efforts when they are not able to communicate as quickly or effectively with injured citizens, and vice versa.

The effects of a petroleum or natural gas shortage would be felt throughout the state. Iowa is almost entirely dependent on out-of-state resources for oil, coal, and natural gas. Electricity failure can result from many hazard events. Severe winter storms, thunderstorms, lightning, extreme heat, tornadoes, high winds, transportation incidents, and others can cause power outages. The loss of electricity could also cause many problems throughout towns including the shutdown of water pumps, sump pumps, and communications.

Damages from structural fires can range from minor aesthetic damage to completely destroying the building. Many factors determine the strength of a fire including: wind, fuel sources, and density of buildings. Older structures with outdated electrical systems and fire codes are particularly vulnerable to fires. With modern training, equipment, fire detection devices, and building regulations and inspections, most fires can be quickly contained and limited to the immediate structure involved.

When a structure does fail, the level of damage and severity of the failure is dependent on factors such as the size of the structure, the number of occupants in, on, or near the structure, the time of day, day of week, etc. Structural failure can be caused by the age of the structure, poor maintenance, of by other hazard events such as tornadoes, fires, floods, or severe winter storms.

Map 3.10 shows the number of state and county bridges in good, fair, and poor condition for Audubon County as of February 10, 2020. Bridges in good condition represent 33% of the County's bridges, 53% of the bridges are in fair condition, and 14% of the bridges are in poor condition.

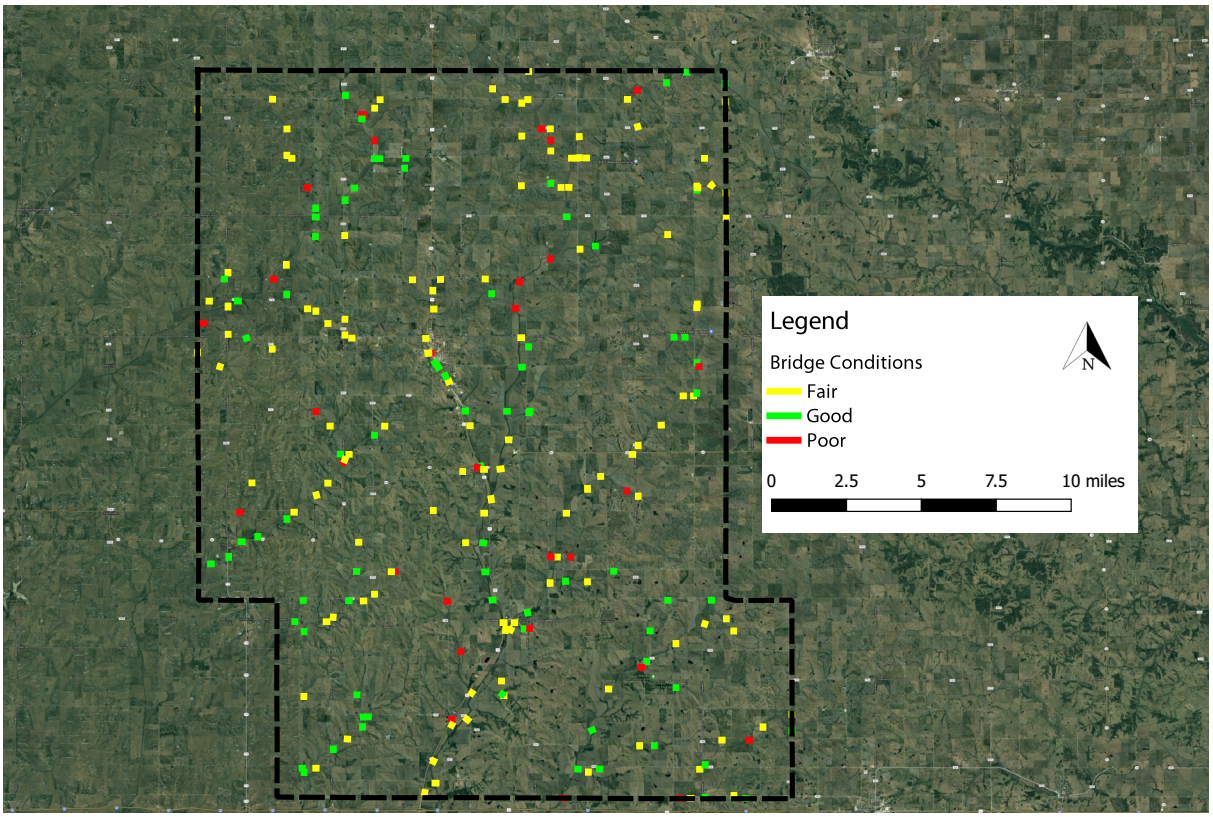
Map 3.11 shows the pavement condition of state and county roadways in Audubon County from 2018 data.

Audubon County is vulnerable to infrastructure failures as they occur with little or no warning. The county is highly likely to experience some form of infrastructure failure annually. It is impossible to predict a communication failure, power outage, fires, or structural failure. While a petroleum or natural gas shortage may be predicted in advance, emergencies can rise suddenly and unexpectedly. Communication failures and power outages can last from several minutes to several days, depending on the nature of the outage and the area that the outage covers. Petroleum and natural gas distribution problems can lead to shortages locally for a few days. The duration of structural fires and structural failures is dependent on the size of hazard. These hazards also are hard to track the total economic impact they have on each county. Within the life of this plan it is anticipated that each county will experience an infrastructure failure of some kind with an unknown magnitude. Each jurisdiction should plan to implement mitigation actions to alleviate the effects of these instances.

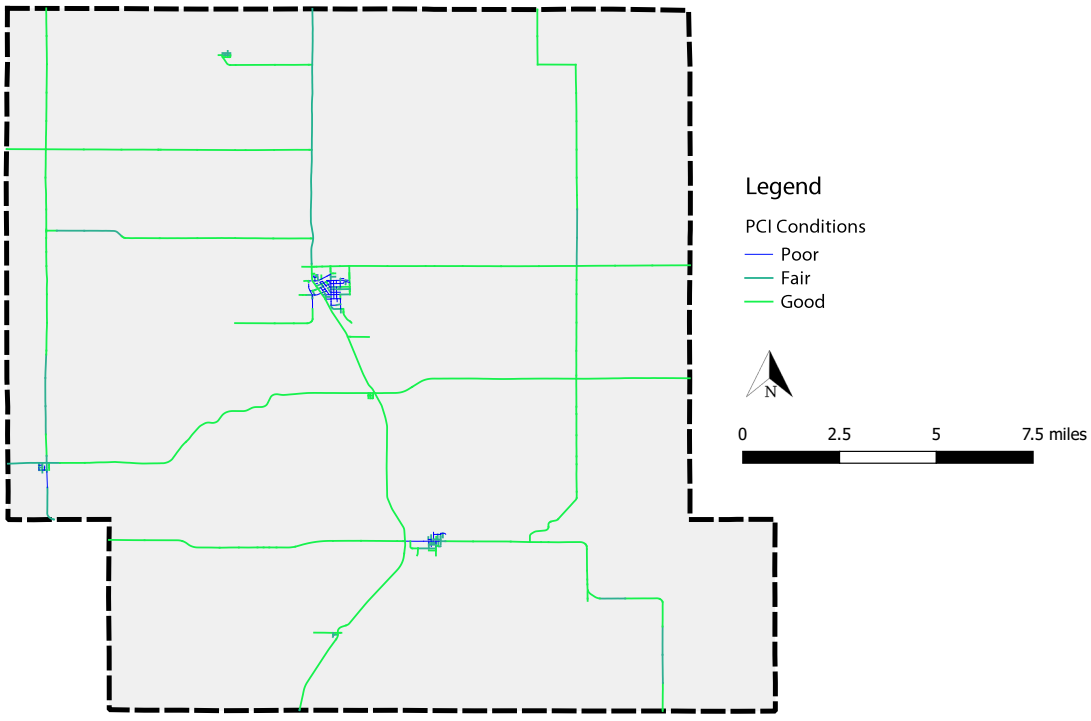
Mitigation actions to minimize the effects of infrastructure failure may include:

- Implement a bridge repair program to fix poor quality bridges
- Create and enforce building codes

Map 3.10: Audubon County Bridge Conditions



Map 3.11: Audubon County Pavement Conditions



Levee/Dam Failure

A dam is defined as an artificial barrier with the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water. Dams are constructed for a variety of uses, including flood control, erosion control, water supply impoundment, hydroelectric power generation, and recreation.

A dam failure occurs when there is an uncontrolled release of impounded water, resulting in downstream flooding, which can affect life and property. FEMA states that dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam
- Deliberate acts of sabotage
- Structure failure of materials used in dam construction
- Movement and/or failure of the foundation supporting the dam
- Settlement and cracking of concrete or embankment dams
- Piping and internal erosion of soil in embankment dams
- Inadequate maintenance and upkeep

In Iowa, dams are classified according to the downstream damages that would occur if that dam were to fail. The higher the risk, the higher the standards that have to be met during dam construction and modification. There are three dam classifications: High Hazard, Significant Hazard, and Low Hazard. High Hazard dams have to meet the state's highest level of criteria and are inspected on a two-year cycle. Dam hazard potential classifications have nothing to do with the condition of a dam, only the potential for death and/or destruction due to the size of the dam, the size of the impoundment, and the characteristics of the area downstream of the dam.

A dam is classified as a High Hazard when it is located in an area where dam failure may create a serious threat of loss of human life. A Significant Hazard Dam is where failure may damage isolated homes or cabins, industrial or commercial buildings, moderately traveled roads, interrupt major utility services, but are without substantial risk of loss of human life. Dams are also classified as Significant Hazard when the dam and its impoundment are themselves of public importance, such as dams associated with public water supply systems, industrial water supply or public recreation, or which are an integral feature of a private development complex. Low Hazard dams are classified as such where damages from a failure would be limited to loss of the dam, livestock, farm outbuildings, agricultural lands and lesser used roads, and where loss of human life is considered unlikely.

Levees differ from dams in that they are constructed alongside the edge of a stream or river channel to manage or prevent water flow into the adjacent land. They were first built in the United States more than 150 years ago and were traditionally used by farmers to protect agricultural areas form frequent flooding, but since then levees have been built to protect urban areas. Artificial levees are typically needed to control the flow of rivers meandering through broad, flat floodplains. Levees are usually constructed from dirt, clay, or artificial material such as concrete or steel and are built wide enough so that they will not collapse or be eroded when saturated with moisture from rivers running at unusually high levels. Grass or some other dense vegetation can be planted on top of the levee's bank to minimize erosion.

It is important to note that levees reduce the risk of flooding, but no not eliminate it. The failure of a levee can be attributed to overtopping or breaching. Overtopping occurs when the river rises higher than a levee's crown. Breaching can result from the loss of structural integrity of a wall, dike, berm or elevated soil by erosion, piping, saturation, under seepage, and even animal burrows. Levees can and do deteriorate over time, so regular maintenance and periodic upgrades are necessary to ensure a levee performs as designed.

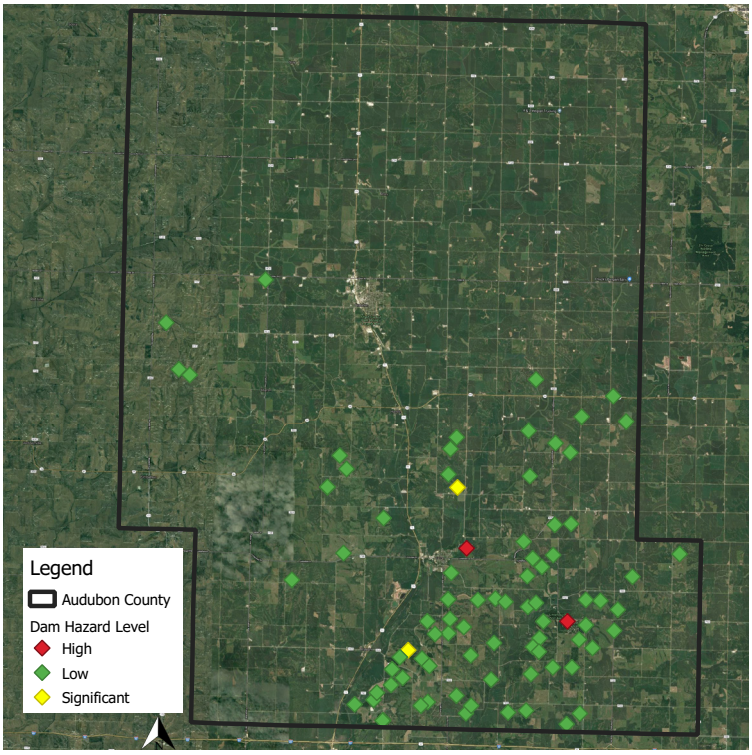
Nearly 85% of levees are locally owned and maintained. It is the responsibility of the levee's owner to provide evidence that the levee meets or exceeds minimum federal requirements. A levee is certified if evidence has been presented showing that the system meets current design, construction, maintenance, and operation standards to provide risk reduction from the one-percent-annual-chance-flood.

According to the National Inventory of Dams, Audubon County has 85 dams as of 2017. The dams that are included in the inventory meet at least one of the following criteria:

- High hazard classification—loss of human life is likely if the dam fails
- Significant hazard classification – possible loss of human life and likely significant property or environmental destruction
- Equal or exceed 25 feet in height and exceed 15 acre-feet in storage
- Equal or exceed 50 acre-feet storage and 6 feet in height

Of the eighty-five Audubon dams in the inventory, two are considered to be high hazard dams and two are considered significant hazard dams. There have been no known occurrences of dam failure in Audubon County. Sound design, quality construction, and continued inspections and repairs reduce the probability of dam failure. Audubon County's dams and their hazard ranking can be found in map 3.12.

Map 3.12: Audubon County Dams and Hazard Ranking



The Iowa DNR is responsible for the state's dam safety program. The program involves the review and approval for the construction of new dams, maintaining an inventory of existing dams that meet minimum size criteria, and the periodic inspection of certain dams. The inventory excludes all dams less than six feet in height regardless of storage capacity and dams less than fifteen acre feet of storage regardless of height. Currently, there are approximately 3,800 dams in the state's inventory.

A majority of Iowa's dams on major rivers are well past their design life cycles. The average life span of a dam is fifty years. The average age of dams in Audubon County 46 years with the average completion year of 1978. This means that within the next one to five years, these dams will reach the end of their design life. With the majority of these dams being at the end of their design life, it is important that they are routinely inspected and maintained to ensure that the dams continue to function properly. The proper maintenance of these

dams is important as there are people and properties located in the area which a dam failure would greatly impact. A dam failure could result in everything from minor property damage to significant property damage and potentially death.

Although Audubon County has not had a dam failure in the reporting period, a dam failure can occur without warning, leaving little or no time for those downstream to escape. Some weak areas and possible failure points can be identified shortly ahead of a failure, allowing some time for evacuation and possible repair of the dam. Similar to dam failures, levee failures are difficult to predict and can occur without warning. High water levels that may result in the overtopping of a levee can sometimes be predicted hours in advance; however, if a levee is breached, there may not be any warning time. Mitigation actions that the jurisdictions may decide to implement could include both prevention and response actions to alleviate the impacts. With the increasing age of the dams within Audubon County, the probability of a dam failure continues to rise annually with the minimal amount of repairs and replacements happening, but it is unlikely still that the county will experience a failure throughout this plan's life.

Dam and levee failure instances are likely to increase due to climate change over the planning period. Flooding is expected to increase, increasing strain on levees and likelihood of failure or overtopping. Drought is also expected to increase, which may cause levees, especially those containing clay, to crack. Heavy precipitation events following these dry spells (a cycle expected to increase with climate change) can worsen the cracks. Dams are more likely to experience increase risk of overtopping, rather than catastrophic failure, but flooding strains the structure as well. Mitigation actions that may be implemented to reduce the impacts of a dam failure may include:

- Consider the creation of a dam failure emergency action plan
- Budget for the demolition and reconstruction of old higher hazard dams to reduce potential for failure

Radiological Incident

A radiological event is an incident resulting in a release of radiological material at a fixed facility to include power plants, hospitals, laboratories and the like. Although the term "nuclear accident" has no strict technical definition, it generally refers to events involving the release of significant levels of radiation. Most commercial nuclear facilities in the United States were developed in the mid-1960s and are designed to withstand aircraft attack. Therefore, they should withstand most natural hazards even though they may not have been specifically designed for those forces (Iowa Hazard Mitigation Plan 2023).

Emergency Classification is a set of plant conditions which indicate a level of risk to the public. Nuclear power plants use the four emergency classifications listed below in order of increasing severity.

Notification of Unusual Event

Under this category, events are in process or have occurred which indicate potential degradation in the level of safety of the plant. No release of radioactive material requiring off-site response or monitoring is expected unless further degradation occurs.

Alert

If an alert is declared, events are in process or have occurred that involve an actual or potential substantial degradation in the level of safety of the plant. Any releases of radioactive material from the plant are expected to be limited to a small fraction of the Environmental Protection Agency (EPA) protective action guides (PAGs).

Site Area Emergency

A site area emergency involves events in process, or which have occurred, that result in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed the EPA PAGs except near the site boundary.

General Emergency

A general emergency involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs for more than the immediate site area (US Nuclear Regulatory Commission).

The Nuclear Regulatory Commission (NRC) defines two emergency planning zones around each nuclear power plant. The exact size and configuration of the zones vary from plant to plant due to local emergency response needs and capabilities, population, land characteristics, access routes, and jurisdictional boundaries. Generally, the two types of emergency planning zones are:

Plume Exposure Pathway

The Plume Exposure Pathway extends about ten miles in radius around the plant. The primary concern is exposure of the public to, and the inhalation of, airborne radioactive contamination.

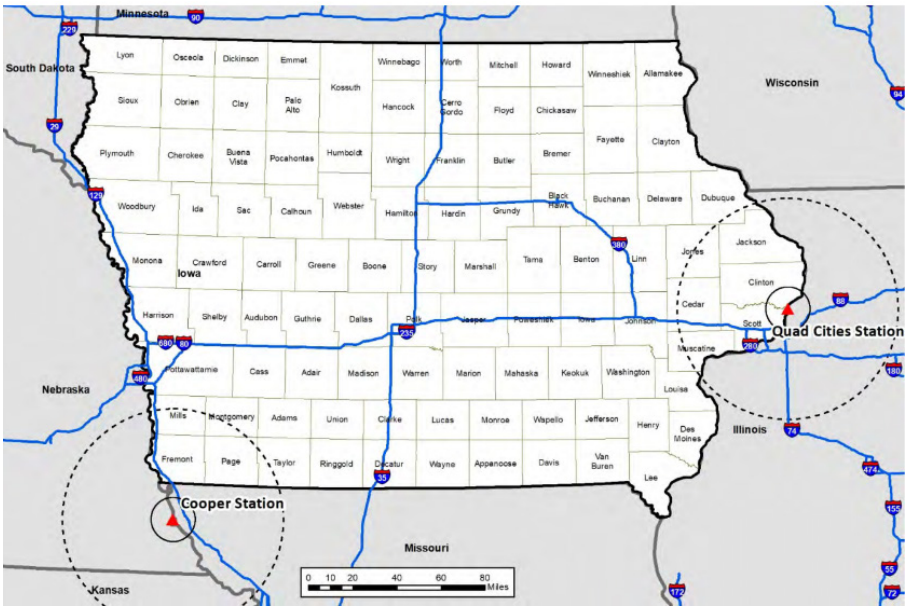
Ingestion Pathway

The Plume Exposure Pathway extends about ten miles in radius around the plant. The primary concern is exposure of the public to, and the inhalation of, airborne radioactive contamination.

The Ingestion Pathway extends about fifty miles in radius around the plant. The primary concern is ingestion of food and liquid that is contaminated by radioactivity.

There are two nuclear power plants that operate close to Iowa's borders; the Quad Cities Generating Station near Cordova, Illinois, and the Cooper Nuclear Station near Brownsville, Nebraska. The map below identifies the location of each facility as well as the 10-mile and 50-mile planning buffers. Neither of these power plants are close enough to the planning area to be included in the 10 or 50 mile planning buffer, but it is still important to recognize their locations and the disruptions that an event at one of these plants could cause within the state.

Map 3.13: Nuclear Plants Impacting Iowa, 2021



Although no longer a power-producing plant, the Fort Calhoun Station was operable until the fuel was removed by November 13, 2016, and will not be considered fully closed until 2026. The site continues to be monitored and follows protocol for site decommissioning.

There have been no general emergency incidents in the United States since the NRC established the classification system in 1980. Iowa has one nuclear power plant located in Linn County. There are three other nuclear power plants near Iowa's borders. In over fifty years of nuclear power production in the United States, no deaths or injuries from radiation have been recorded among the general public. Time, distance, and shielding minimize radiation exposure to the body. It is more likely that a radiological incident in Audubon County would occur because of a transportation incident, but it is still highly unlikely that Audubon County will experience a radiological incident. Radiological incidents occur with little or no warning. Since 1990, hundreds of shipments have been made through Iowa. There have been no occurrences of a radiological incident in Iowa. Transportation accidents are the most common type of incident involving radioactive materials because of the sheer number of radioactive shipments (Iowa Hazard Mitigation Plan, 2023).

Terrorism

This hazard encompasses the following: enemy attack, biological terrorism, agro-terrorism, chemical terrorism, conventional terrorism, cyber terrorism, radiological terrorism, and public disorder. This includes the use of multiple outlets to demonstrate unlawful force, violence, and/or threat against persons or property causing intentional harm for purposes of intimidation, coercion, or ransom in violation of the criminal laws of the United States. These actions may cause massive destruction and/or extensive casualties.

Enemy Attack

An enemy attack incident that would cause massive destruction and extensive casualties. An all out war would affect the entire population. Some areas would experience direct weapons' effects: blast, heat, and nuclear radiation; others would experience indirect weapons' effects, primarily radioactive fallout. (Iowa Hazard Mitigation Plan, 2023)

Biological Terrorism

The use of biological agents against persons or property for purposes of intimidation, coercion, or ransom can be described as biological terrorism. Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point of line sources. Biological agents may pose viable threats from hours to years depending upon the agent and the conditions in which it exists. Depending on the agent and the effectiveness in which it was deployed, contamination can be spread by wind or water. Infections can also be spread by human or animal vectors.

Agro-Terrorism

Agro-Terroism is causing intentional harm to an agricultural product or vandalism of an agricultural/ animal related facility. Activities could include the following: intentional release of lab animals, deliberate contamination of bulk milk tanks, poisoning animals, destruction of crops/facilities, and theft of agricultural products, machinery or chemicals, and vandalism of agricultural facilities.

Chemical Terrorism

The use or threat of chemical agents against persons or property for purposes of intimidation, coercion, or ransom. Liquid/aerosol or dry contaminants can be dispersed using sprayers or other aerosol generators. Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists. Contamination can be carried out of the initial target area by people, vehicles, water, and wind.

Conventional Terrorism

The use of conventional weapons and explosives against persons or property for purposes of intimidation, coercion, or ransom. Hazard effects are instantaneous; additional secondary devices may be used, lengthening the duration of the hazard until the attack site is determined to be clear. The extent of damage is determined by the type and quantity of explosive. Effects are generally static other than cascading consequences, incremental structural failures, etc. Conventional terrorism can also include tactical assault of sniping from remote locations.

Cyber Terrorism

Cyber terrorism is an electronic attack using one computer system against another in order to intimidate people or disrupt other systems. Cyber terrorism may last from minutes to days depending upon the type of intrusion, disruption, or infection. Generally, there are no direct effects on the built environment, but secondary effects may be determined depending upon the system being terrorized. Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks.

Radiological Terrorism

Radiological terrorism is the use of radiological materials against people or property for purposes of intimidation, coercion, or ransom. Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point of line sources such as munitions, covert deposits, moving sprayers, or by the detonation of a nuclear device.

Public Disorder

Public disorder is the assembling of people together in a manner to substantially interfere with pubic peace to constitute a threat, and with use of unlawful force or violence against another person, or causing property damage or attempting to interfere with, disrupting, or destroying the government, political subdivision, or group of people. Examples include mass demonstrations, or direct conflict by large groups of citizens, as in marches, protest rallies, riots, and non-peaceful trikes. Labor strikes and work stoppages are not considered in this hazard unless they escalate into a threat to the community (Iowa Hazard Mitigation Plan 2023).

There are many small military installations in Iowa; most are Iowa National Guard assets spread throughout the state comprised of various military units and functions. The Iowa National Guard headquarters resides at Camp Dodge in Johnston. There have been no enemy attacks on or in Iowa in modern times and it is unlikely that Iowa would be a primary target during an enemy attack. However, an enemy attack is still a possibility due to international conflicts and the large number of weapons in existence throughout the world.

Following September 11, 2001, the country became more aware that terrorism is a very real threat. The Center for Disease Control (CDC) & Health Resources and Services Administration (HRSA) felt public health departments and hospitals would play a large role in preparedness for bioterrorism. In September 2002, the Iowa Department of Public Health (IDPH) received grant funding from the CDC for public health preparedness

and funding from HRSA for hospital readiness efforts. All Iowa public health departments and hospitals are responsible for these efforts in their counties. The IDPH has set up six regions across Iowa to work together in these planning and preparedness efforts.

Agro-terrorism incidents have occurred in the State of Iowa, although on a limited scale. Animal rights activists have vandalized or released animals in agricultural facilities; also there has been vandalism to agricultural facilities or incidents of disgruntled employees causing damage to animals and animal products. There are frequent cases of theft of agricultural machinery, products, and chemicals. Chemical terrorism is even more uncommon than agro-terrorism, there have only been two identified chemical terrorism incidents in Iowa. One incident involved mailing rat poison to a number of state and local officials; the other incident involved individuals breaking into a city's water supply and suspected of depositing chemicals in the water supply.

The State of Iowa has experienced many bomb threats. In the spring of 2002, eighteen pipe bombs were found in mailboxes in five states stretching from Illinois to Texas, including Iowa. Five pipe bombs were found in Iowa and six people were injured in the bombings in Iowa and Illinois. In 2005 and 2006, pipe bombs were used in attempted murder cases in Forest City and Altoona.

Cyber-security and critical infrastructure protection are among the most important national security issues facing the United States today, and they will likely only become more challenging in the future. Recent attacks have disrupted electronic commerce and have had a debilitating effect on public confidence in the Internet.

Although large-scale destructive civil disturbances are rare, the potential is always there for an incident to occur. Often times, television, radio, and internet coverage helps to spread the incident to other uninvolved or unaffected areas, exacerbating an already difficult situation. Alcohol is often involved in public disorder, especially related to college campuses, sporting events, and concerts (Iowa Hazard Mitigation Plan 2010).

Unfortunately, there will never be a way to totally eliminate all types of terrorism. Audubon County is unlikely to experience a terrorism incident within the planning period, but with the uncertain nature of the world, each jurisdiction may want to plan for the response and mitigation of the attack. If a person or persons are inclined to cause death and destruction, they are usually capable of finding a way to carry out their plans. Areas near government buildings, military complexes, and transportation, communication, and fuel facilities, would experience the largest impacts. Because Iowa serves as a food provider to the world, there is an increased risk of agro-terrorist activity. A full-scale attack in the foreseeable future is not likely; however, a limited attack could take place that could potentially threaten target areas. Acts of terrorism can be immediate and often come after little or no warning. The duration of a terrorist attack depends on the type of terrorism. A biological, chemical, or radiological attack could affect people/property for days, weeks, months, even years, depending on the substance used and the size of the area impacted. Due to the small size of the communities in Audubon County, if public disorder should occur, it is expected to be resolved within hours. Conventional terrorism usually involves firearms and/or explosives. These events are short-term in nature, and would not be expected to last very long. The committee determined that on average, a terrorism event would last less than one day.

Mitigation actions that may be implemented to prevent or reduce the impacts of a terrorism may include:

- Promote the "If You See Something, Say Something" campaign

Transportation Incident

The hazard includes all modes of transportation- air, highway, railway, and waterway. This includes any transportation accident that directly threatens life and which results in property damage and/or death(s)/injury(s) and/or adversely impacts a community's capabilities to provide emergency services.

An air transportation incident may involve a military, commercial, or private aircraft. Air transportation is playing a more prominent role in transportation as a whole. Airplanes, helicopters, and other modes of air transportation are used to transport passengers for business and recreation, as well as thousands of tons of cargo. A variety of circumstances can result in an air transportation incident: mechanical failure, pilot error, enemy attack, terrorism, weather conditions, and on-board fires can all lead to an incident. Statistics from the National Transportation Safety Board and the airline industry show that the majority (over 75%) of airplane crashes and accidents occur during the takeoff or landing phases of the flight.

A highway transportation incident can be single or multi-vehicle requiring responses exceeding normal day-to-day capabilities of response agencies. An extensive surface transportation network exists in Iowa; local residents, travelers, businesses, and industries rely on this network on a daily basis. Hundreds of thousands of trips a day are made on the streets, roads, highways, and interstates in the state; if the designed capacity of the roadway is exceeded, the potential for major highway incident increases. Weather conditions play a major factor in the ability of traffic to flow safely in and through the state.

Railway incidents may include derailments, collisions, and highway/rail crossing accidents. Train incidents can result from a variety of causes: human error, mechanical failure, faulty signals, and/or problems with the track. Results of an incident can range from minor "track hops" to catastrophic hazardous material incidents and even human/animal casualties. With the many miles of track in Iowa, vehicles must cross the railroad tracks at numerous at-gate crossings.

Waterway incidents will primarily involve pleasure crafts on rivers and lakes. In the event of an incident involving a water vessel, the greatest threat would be drowning, fuel spillage, and/or property damage. Waterway incidents may also include events in which a person, persons, or object falls through the ice on partially frozen bodies of water (Iowa Hazard Mitigation Plan 2023).

The 2020 Iowa Aviation System Plan classifies airports into five categories: Local Service, Basic Service, General Service, Enhanced Service, and Commercial Service. Each system role is defined by a set of criteria based upon current levels of infrastructure and services. Currently there are eight Commercial, fifteen Enhanced, thirty General, eighteen Basic, and forty-one Local airports within the state.

Audubon County has one airport. The airport, Audubon County Airport, is located south of Audubon and is owned by the Audubon County Airport Authority. The airport is located along US Highway 71, just south of the Audubon city limits. The Iowa Aviation System plan 2010-2030 estimates that the Audubon County Airport will grow from five based aircraft in 2010 to six based aircraft in 2030. During that same period, the number of operations will increase from 1,250 to 1,500.

From January 1, 2018 to September 18, 2024 there was one air traffic incident in Audubon County. According to the National Transportation Safety Board, the incident occurred on March 31, 2020 and was fatal for the pilot and passenger.

The predominant transportation network in the planning area, as well as the State of Iowa, is highways and roads. All modes of transportation, including air, rail, trails, and transit systems require the use of highways and roads.

Map 3.14 displays the major highways and their average annual daily traffic (AADT) in Audubon County. According to the Iowa Department of Transportation, from 2018-2023, Audubon County had 398 traffic accidents. These accidents resulted in 6 fatalities and 156 injuries. 39% of the accidents in Audubon County caused an injury or fatality.

As the volume of traffic on streets, highways, and interstates increase, the number of traffic accidents will increase too. The combination of traffic volume, weather conditions, mechanical error, and human error creates the potential for a traffic accident.

Railroads are a vital part of Iowa's overall transportation system, helping to move both freight and passengers safely and efficiently. Railroads are critical in moving some of Iowa's commodities including corn, soybeans, chemicals, motor vehicles, wood and paper products, minerals and ores, coal, and biofuels. Maintaining and improving railroad service in Iowa requires a proactive partnership between a number of organizations, including private rail carriers, rail shippers, passengers, the Iowa DOT, other state and federal agencies, and local governments.

Audubon County does not have a rail presence. Even with rail miles decreasing, Iowa's rail traffic has doubled over the last fifteen years and is expected to keep increasing. Iowa ranks eleventh in the country in terms of total rail miles. Rail cars are getting larger and trains are getting longer. In 1990, the majority of trains were twenty-four cars or less; today, the majority of trains are averaging one hundred cars. Overall, derailments have declined, as have rail/highway crossing accidents. There are still incidents that occur, but the number of those incidents has decreased.

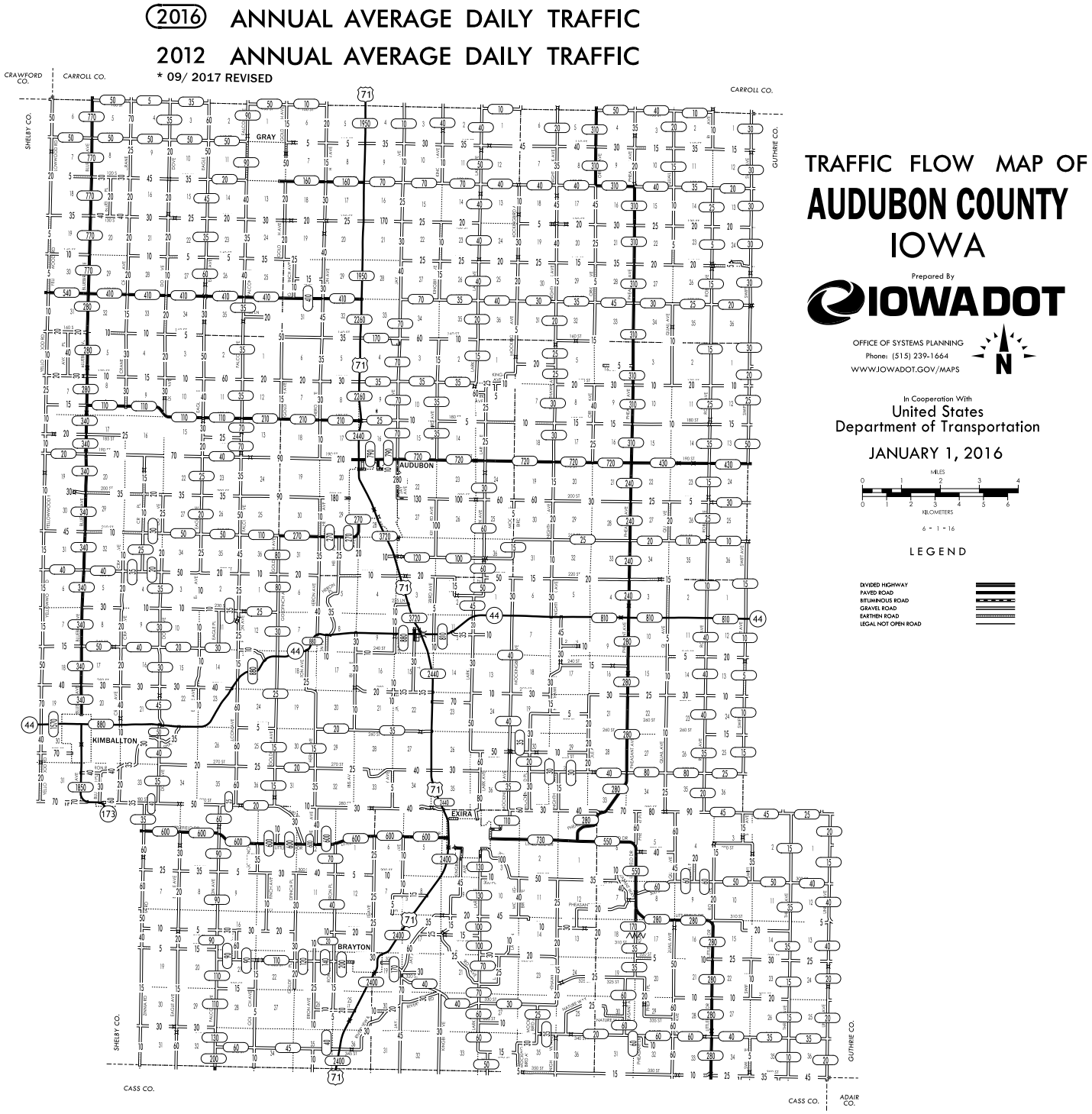
In 2021, 517,100 rail carloads originated in Iowa and 257,300 terminated in the state. These carloads hauled the 60.1 million tons of freight that originated in Iowa, 29.9 million tons that terminated in Iowa. Roughly 215.4 million tons of freight passed through the state in 2021.

Rail accidents of all kinds, including derailments and track or equipment failures, have decreased over time. More importantly, crossing accidents involving trains and automobiles have also decreased. This comes at a time when rail traffic is increasing, which means that safety is improving substantially.

There have been no disasters causing waterway incidents in Iowa. There have been numerous search and rescue events involving a single person or small boats with only a few people on board. Small-scale incidents on lakes and rivers have resulted in the loss of life form pleasure craft collisions and/or falls from vessels. Audubon County does not have any navigable waterways for commercial purposes.

It is highly likely for Audubon County to experience some form of transportation incident within the life of this plan. Vehicular accidents are the most likely to occur on a regular basis. There were 398 incidents of traffic accidents in Audubon County from 2018-2013. While the county experienced an air traffic accident during the last planning period, these incidents are not as likely to occur on a regular basis. If a waterway incident were to occur, it would not include a commercial watercraft, but could include personal pleasure craft collisions and/or falls. All jurisdictions should be prepared to respond to any transportation incident as they occur without warning and each incident is different. As transportation modes and infrastructure varies by jurisdiction, each jurisdiction will need to evaluate their transportation system and implement action items that fit their needs.

Map 3.14: Audubon County AADT



A number of resources were used in gathering the information used in this chapter. They are as follows: Iowa Hazard Mitigation Plan 2023; Association of State Dam Safety Officials; Iowa DNR; National Inventory of Dams; FEMA; National Weather Service; NOAA; National Climatic Data Center; National Drought Mitigation Center; National Wildfire Coordinating Group; National Fire Protection Association; National Severe Storms Laboratory; Vaisala Inc.; Storm Prediction Center; The Weather Channel; Iowa Department of Agriculture; Iowa State University Extension; American Association of Equine Practitioners; Iowa Department of Public Health; The Center for Food Security and Public Health; U.S. Nuclear Regulatory Commission; Iowa Department of Transportation; Iowa Department of Transportation Office of Aviation; American Association of Railroads; Federal Railroad Administration Office of Safety Administration; and Audubon County Home Health, Hospice and Public Health

Chapter 4: Vulnerability Assessment and Loss Estimates

The final step in the risk assessment is to identify the likely level of loss for each type of hazard determined to affect the jurisdiction. The vulnerability assessment and loss estimates assess the County's total exposure to identified hazards. The vulnerability assessment consists of a vulnerability overview for each profiled hazard, an evaluation of potential losses to existing development, a description of the methodology used to estimate losses, and data limitations/corrective actions.

Risk assessment information was gathered from all jurisdictions through discussions held at jurisdiction meetings. Information provided was compared to reported data and compiled. The information provided and discussions identified if a hazard had occurred in the jurisdiction previously, if the hazard was likely to occur in the future, the probability of the hazard occurring in a given year, the magnitude/severity the hazard would have on the jurisdiction, the amount of warning time before a hazard occurred, and the estimated duration that the hazard would last. The final risk assessments were written after further discussion with the Hazard Mitigation Committee, public responses and further detailed research on past hazard occurrences. The risk assessment information, as provided by Audubon County and individual jurisdictions in Appendices A through F, varies slightly due to geographical area and jurisdictional representatives' personal opinions on the identified hazards and their associated risks. For example, a transportation incident may impact each jurisdiction differently depending on the location of highways and airports in relation to the jurisdiction.

County-wide assessments have been determined for each hazard that could have affect a large portion of the county. These hazard assessments are represented in the Audubon County Appendices. Each individual city has assessed these individual hazards differently based upon history and experience.

Structural Inventory

A structural inventory was completed for the corporate limits of each jurisdiction in Audubon County, with the county included. Structural inventories were completed to determine the type, number and value of structures within each jurisdiction. This information is critical to help determine vulnerability and potential losses in each jurisdiction. Structures were classified into the following categories:

- Residential – structures which are primarily used or intended for human habitation.
- Commercial – structures primarily used or intended as a place business where goods, wares, services, or merchandise is stored or offered for sale. Commercial also includes hotels, motels, rest homes, structures consisting of three or more separate living quarters and any other buildings for human habitation that are used as a commercial venture.
- Industrial – structures used primarily as a manufacturing establishment.
- Agricultural – Structures located on all tracts of land which are used primarily for agricultural purposes, except buildings which are primarily used or intended for human habitation.

Loss Estimates

Potential losses for each hazard, as identified by each jurisdiction, were estimated using the structural inventory. It is beyond the scope of this plan to complete an inventory of structures and critical facilities located within the 100-year floodplain. The Iowa Department of Natural Resources, along with the Iowa Flood Center, created new, comprehensive, accurate floodplain maps for Iowa cities and counties. The maps show the boundaries of flooded areas for the 1% annual chance (100-year) and 0.2% annual chance (500- year) floods. According to Iowa Department of Homeland Security and the Iowa Department of Natural Resources, there is only one repetitive loss property within Audubon County. This property is residential but it is unknown if there is a structure still on the property. The results from the structural inventories are discussed in more detail for each jurisdiction in Appendices A through F.

To determine the extent of an area that is susceptible to damages from each hazard, the committee estimated the magnitude/severity of each hazard on the jurisdiction. The magnitude/severity is an assessment in terms of injuries, fatalities, and property and infrastructure damage. The number of structures in the hazard area was determined by taking the maximum magnitude/severity percentage from chapter 3. Table 4.1 shows the percentages used.

Table 4.1: Loss Estimate Magnitude and Severity Impacts

Description		Percentage Used in Loss Estimates
Catastrophic	More than 50% of property severely damaged Shutdown of facilities and services for more than 30 days Multiple deaths	100%
Critical	25% to 50% of property severely damaged Shutdown of facilities and services for at least 2 weeks Injuries/illnesses that results in permanent disability	50%
Limited	10% to 25% of property severely damaged Shutdown of facilities and services for more than a week Injuries/illnesses that do not result in permanent disability	25%
Negligible	Less than 10% of property severely damaged Shutdown of facilities and services for less than 24 hours Injuries/illnesses treatable with first aid	9%

The committee determined that Audubon County is vulnerable to the following hazards:

- Animal/Plant/Crop Disease
- Drought
- Extreme Heat
- Flash Flood
- Grass or Wild Land Fire
- Hailstorm
- Hazardous Material
- Human Disease
- Infrastructure Failure
- Radiological
- River Flooding
- Severe Winter Storms
- Sinkholes
- Terrorism
- Thunderstorm and Lightning
- Tornado
- Transportation Incident
- Windstorm

Based on the potential impacts of each hazard that is listed above, the vulnerability and loss estimates for each jurisdiction in Audubon County was calculated. All structural data in the tables and figures are based on 2023 information from the Iowa Department of Management taxable land values and population data came from the 2020 U.S. Census.

The "Number of Vulnerable Structures" comes from Assessor information and are based on those structures that are exposed to each hazard. While 100% of the jurisdiction may be vulnerable to a hazard, not 100% of jurisdiction will necessarily experience damages due to the hazard. The "Number of People Vulnerable" for each hazard was based on the total population. By multiplying the total population for the county by the percentage of exposure, the number of residents at risk could be calculated.

It is unlikely that a jurisdiction can determine the impact any hazard will have. If a hazard were to impact the entire county, the numbers in table 4.2 shows the number of people who would be affected and the maximum number of structures and their value. If this type of event were to occur, a shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability or even death.

Table 4.2: Audubon County Maximum Exposure

Type of Structure	Value of Structures	Number of People
Agricultural	$337,164,020	5,674
Commercial	$31,927,926	
Industrial	$39,439,417	
Residential	$120,180,708	

The following hazards were determine to have a limited impact on Audubon County were they to occur.

- Dam and Levee Failure
- Expansive Soils
- Extreme Heat
- Flash Flood
- Grass or Wild Land Fire
- HAZMAT Incident
- River Flooding
- Thunderstorm/Lightning/Hail
- Tornado

A shutdown of some facilities and services could last more than a week and any injuries/illnesses would not result in permanent disability. It is estimated that 25% of the County would be impacted.

Table 4.3: Audubon County Limited Hazard Impacts

Type of Structure	Value of Structures	Number of People
Agricultural	$84,291,005	1,418
Commercial	$7,981,981	
Industrial	$9,859,854	
Residential	$30,045,177	

The following hazards were determine to have a critical impact on Audubon County were they to occur.

- Animal/Plant/Crop Disease
- Drought
- Earthquake
- Human Disease
- Infrastructure Failure
- Severe Winter Storms
- Transportation Incident
- Windstorm

A shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability. It is estimated 50% of the County would be impacted.

Table 4.4: Audubon County Critical Hazard Impacts

Type of Structure	Value of Structures	Number of People
Agricultural	$168,582,010	2,837
Commercial	$15,963,963	
Industrial	$19,719,709	
Residential	$60,090,354	

Each individual jurisdiction and rural county loss estimates can be found in their respective appendix.

Chapter 5: Mitigation Strategies

Section 201.6 (c)(3)(i): The plan must contain a mitigation strategy that provides the jurisdictions 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 must include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

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

The hazard mitigation goals, objectives and actions are directly connected to the hazard analysis and risk assessment. After the hazard risk analysis was completed for each jurisdiction, broad-based county-wide goals were developed to address hazards and their impact on jurisdictions. The committee used a top-down approach where the overall goals were determined, then worked down to establish more specific objectives and even more specific mitigation actions. As a starting point, each jurisdiction was provided with the goals from their previous hazard mitigation plan. If a jurisdiction did not have a previous hazard mitigation plan, they were given the county's previous goals. This hazard mitigation plan's goals are identified as follows:

- Maintain and protect public infrastructure
- Minimize deaths, injuries, property loss, and vulnerability due to natural hazards
- Improve coordination, public communication, education, and awareness of hazards
- Enhance community protection
- Maintain and support public safety facilities, including equipment and training

Using the plan goals as a platform, each jurisdiction decided upon mitigation objectives and actions to help reduce or eliminate the impacts of hazards. Objectives were defined as strategies or steps to achieve the goals that have been set. They are more specific and narrower in scope than goals. It is important that the objectives be measurable in order to determine if the action was successfully implemented. Actions were defined as specific activities to reduce hazard risks. Actions can be classified into six mitigation categories-prevention, property protection, public education and awareness, natural resource protection, emergency services and structural projects.

Each committee member was supplied with a supplement to provide help in picking mitigation actions. The supplement was titled *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*. The booklet contained a list of possible hazard mitigation measures for communities compiled from FEMA. The list gives mitigation ideas for natural hazard types, such as flood, tornadoes and drought. A worksheet was also distributed to committee members with examples of mitigation objectives and actions from several approved mitigation plans. In addition, committee members were given copies of their jurisdiction's previous objectives and actions from past hazard mitigation plans. As extensive as the three resources were, they did not prohibit other local ideas for actions to save lives and prevent or reduce damages.

This plans mitigation goals and objectives fall under the state's three main goals to provide complete protection to the citizens of the county. Each of the county's goals falls under the umbrella of the states three main goals which include:

- Protect the health, safety, and quality of life for Iowa citizens while reducing or eliminating property losses, economic costs, and damage to the natural environment caused by a disaster.
- Ensure government operations, response, and recovery are not significantly disrupted by disasters.
- Expand public awareness and encourage intergovernmental cooperation, coordination, and communication to build a more resilient community against all hazards.

Action Plan

The Action Plan is a combination of the hazards addressed by each action, the prioritization of actions, the responsible department for the action, the estimated cost of the action, the potential funding source for the action, the mitigation measure category, and the target completion date of the action. All of these categories are explained in the following sections. The county-wide action plans can be found later in this chapter, the city and school district's Action Plans can be found in their respective appendix.

Priority

Priority for each action is determined as High, Moderate, or Low.

- High- Completing this action item is vital to the jurisdiction's efforts towards either mitigating hazards or responding to them. The benefit of completing this project is greater than the cost. These projects tend to need to be completed within a short timeframe.
- Moderate – Completing this action would benefit the city's efforts towards mitigating hazards or responding to them, but if these projects are not completed, the jurisdiction can still further their efforts. The cost of these projects equals the benefit on the jurisdiction. These projects need to be completed in the mid timeframe.
- Low- If this action were to be completed, the jurisdiction would benefit, but if it is not completed, it will not be detrimental to the city's hazard mitigation efforts or response. The cost of the project outweighs the benefit the project will have on the jurisdiction. These projects tend to be completed long-term.

Estimated Cost

Estimated costs for each action is determined as: minimal, low, moderate or high based on the following:

- Minimal – cost estimate is $9,999 or less
- Low – cost estimate ranges from $10,000 to $99,999
- Moderate – cost estimate ranges from $100,000 to $299,999
- High – cost estimate is $300,000 or greater

Mitigation Measure Categories

Prevention Actions

Prevention actions are intended to address future development. These actions influence the way land and buildings are developed and built. These actions ensure that future development does not increase hazard losses, and guides future development away from hazards. Examples of these actions include:

- Planning and zoning codes that limit development in a floodplain
- Building codes
- Capital improvement programs that prevent extension of public infrastructure into hazard areas
- Open space preservation and development of parks and recreational areas in hazard prone areas
- Storm water management regulations.

Property Protection Actions

Property protection actions modify existing structures or their surroundings to protect them from a hazard. These actions directly protect people and property at risk. Protecting a building does not necessarily affect the building's appearance and is therefore a popular mitigation action for historic and cultural sites. Examples of these actions include:

- Acquisition of lands that are vulnerable to damage
- Elevation
- Relocation of hazard-prone structures to safer areas
- Structural retrofits to reduce damage by future hazards
- Storm shutters
- Flood-proofing

Public Education and Awareness Actions

Actions to inform and educate citizens, elected officials, and property owners about hazards and the actions they can take to avoid potential damage and injury. These actions are directed toward property owners, business owners, and visitors to the community. Examples include:

- Outreach projects that provide hazard information to the public, business and property owners
- Real estate disclosure so that potential property owners are informed of the risk before purchase
- Hazard information centers
- School-age and adult education programs

Natural Resource Protection Actions

Actions that reduce the intensity of hazard effects and preserves or improves the quality of the environment and wildlife habitats. The actions are usually implemented by parks, recreation, or conservation agencies and organizations. These actions can include:

- Sediment and erosion control
- Stream corridor restoration
- Watershed management
- Forest and vegetation management
- Wetland restoration and preservation
- Expanding public open space

Emergency Services Actions

Actions that protect people and property before, during, and immediately after a disaster or hazard event. Examples of these actions are:

- Warning systems
- Emergency response services
- Protection of critical facilities and infrastructure

Structural Project Actions

Actions are called "structural" because they involve the construction of structures or devices to reduce the impact of hazards. Actions in this category directly protect people at risk. These actions can include:

- Dams
- Levees
- Floodwalls
- Retaining walls
- Safe rooms
- Reservoirs to store drinking water
- Diversion of storm water

Target Completion Date

The target completion date is the estimated amount of time that the jurisdiction feels the action can be completed in. It is broken into four categories:

- Short – 0 to 2 years
- Mid – 3 to 6 years
- Long – 7+ years
- Ongoing

There have been some changes in the plan's project priorities since the last update. Some projects that were prioritized as a high priority have been completed utilizing available grant and local funds. Other projects that were not high priority were implemented as funds were available, and those that either had no funding available or were not a high priority were not implemented during this planning period. The County's Mitigation Actions were developed with the county's new priorities in mind which have shifted from the last planning period due to changes in elected officials and staff. The priorities also have changed due to the county's economic climate and instances of hazards within the county.

Rural Audubon County Status of Previous Mitigation Actions

Table 5.1: Rural Audubon County Status of Previous Mitigation Actions

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Develop HAZMAT resource contacts within the County and with other Counties		X			
Encourage regular inspection of critical facilities			X		
Maintain a 24/7 directory of critical facilities contact			X		
Write down county's action in case of emergency (what is the county doing and what should the others do)	X				
Public safety radio for conservation officer	X				
Instruct homebound people to develop a plan for severe weather events			X		
Establish a list of homebound/special needs population			X		
Encourage residents to develop an emergency plan for each hazard			X		
Encourage joint training exercise			X		
Coordinate flood control efforts with landowners and county road departments			X		
Community drills			X		
Build a saferoom at Littlefield		X			
Update emergency communication equipment	X				

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Train/coordinate surrounding communities for confined space extraction			X		
Obtain/purchase needed supplies/equipment for confined space evacuation	X				
Acquire NOAA weather radios for selected businesses and residents	X				
Acquire more weather radios when funds are available					X
Alert system for Littlefield Recreation Area			X		
Participate in buy-out projects when available			X		
Update the wireless radio system and dispatcher room	X				
Implement reverse 911	X				

Rural Audubon County Action Plan

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table 5.2: Rural Audubon County Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other community assets from the effects of hazards**
Objective 1	Improve critical facilities safety
Objective 2	Improve warning capabilities
Objective 3	Coordinate response between county and critical facilities
Goal 2	**Minimize to the greatest possible extent the vulnerability of the people of Audubon County to the impacts of all identified hazards**
Objective 1	Improve safety at Littlefield
Objective 2	Account for vulnerable population
Goal 3	**Improve coordination, communication, and response operations with other relevant organizations**
Objective 1	Improve communication among emergency responders
Goal 4	**Improve public communication, education, and awareness of hazards and their risks in Audubon County**
Objective 1	Provide education and training to increase public awareness

Table 5.3: Rural Audubon County Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Develop HAZMAT resource contacts within the County and with other Counties	HAZMAT Incident	Med-High	Fire Department	Minimal	County Funds, EMA Budget, Local Fire Department Budgets	Emergency Services	Short
Encourage regular inspection of critical facilities	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/ Hail, Tornado, Transportation Incident, Windstorm	Medium	Fire Department, Law Enforcement	Minimal	County Funds	Property Protection	Ongoing
Maintain a 24/7 directory of critical facilities contact	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/ Hail, Tornado, Transportation Incident, Windstorm	Medium	Fire Department, Law Enforcement, EMA, Public Health	Minimal	County General Fund	Property Protection, Emergency Services	Ongoing
Instruct homebound people to develop a plan for severe weather events	Severe Weather Events	Medium	EMA, Public Health	Minimal	County General Funds	Public Education and Awareness	Ongoing

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Establish a list of homebound/ special needs population	Severe Weather Events	Medium	EMA, Public Health	Minimal	County General Funds, County Public Health Funds	Public Education and Awareness	Ongoing
Encourage residents to develop an emergency plan for each hazard	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/ Hail, Tornado, Transportation Incident, Windstorm	Medium	EMA, Public Health	Minimal	County Funds, EMA Budget	Public Education and Awareness	Ongoing
Encourage joint training exercise	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/ Hail, Tornado, Transportation Incident, Windstorm	Medium	Fire Department, Law Enforcement	Minimal	County EMA, Local Fire Department Budgets, Local Police/Sheriff Department Funds	Property Protection	Ongoing
Coordinate flood control efforts with landowners and county road departments	Flooding	Medium	County Board of Supervisors	Minimal	County Funds, County Secondary Roads, Private Funds	Property Protection	Ongoing

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Community drills	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/ Hail, Tornado, Transportation Incident, Windstorm	Medium	EMA, Law Enforcement, Fire Department, Public Health	Minimal	County Funds, Local Fire Department Budgets, County EMA, Local Police Department/ Sheriff's Department	Public Education and Awareness	Ongoing
Build a saferoom at Littlefield	Thunderstorm/Lightning/Hail, Tornado, Windstorm, Severe Winter Storm	High	County Conservation	Low	County Conservation Funds, FEMA HMGP, Local Foundations	Emergency Services	Short
Train/coordinate surrounding communities for confined space extraction	Infrastructure Failure	Medium-High	Fire Department	Low	County EMA, Local Fire/Police Department Budgets, FEMA AFG, Local Foundations,	Emergency Services	Short
Alert system for Littlefield Recreation Area	Severe Weather Events	High	EMA	Minimal-Low	County EMA, County Conservation, Local Foundations, FEMA HMGP, USDA Community Facilities	Emergency Services	Short

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Participate in buy-out projects when available	Flooding	Low	County Board of Supervisors	Low	County Funds, FEMA Disaster Funds, Local Foundations	Property Protection	Mid
Purchase and outfit a Mobile Command Trailer	Flash Flood, HAZMAT Incident, Infrastructure Failure, Levee/ Dam Failure, River Flooding, Severe Winter Storm, Terrorism, Tornado, Windstorm	High	EMA, Law Enforcement, Communications Center	Low-Moderate	Communications Center Budget, Local Foundations, FEMA HMGP	Emergency Services	Short
Purchase and outfit a Multi-Agency Sheriff/EMA UTV	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/ Hail, Tornado, Transportation Incident, Windstorm	High	EMA, Sheriff	Low	FEMA AFG, EMA Budget, Sheriff's Department, Local Foundations, FEMA HMGP	Emergency Services	Short
Purchase a deployable pump with boom for rural water supply/fire operations	Grass/Wild Land Fire, Infrastructure Failure	High	EMA, Fire Departments	Low-Moderate	FEMA AFG, Local Departments, EMA, FEMA HMGP, Local Foundations	Emergency Services	Short
Construct a storm shelter at both Secondary Roads Locations - Audubon and Exira	Thunderstorm/Lightning/Hail, Tornado, Windstorm, Severe Winter Storm	High	Secondary Roads, County Supervisors	High	County Supervisors, Secondary Roads, FEMA HMGP, Local Foundations, County Conservation	Structural Project	Mid

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Install a back-up server/ redundancy system	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/ Hail, Tornado, Transportation Incident, Windstorm	High	County Supervisors, Communications Center, EMA	Moderate	Local Foundations, County Supervisors, Sheriff Department, EMA, FEMA HMGP	Emergency Services	Short

Chapter 6: Plan Maintenance and Adoption

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

Monitoring, Evaluating, and Updating the Plan

With the adoption of this plan, the Emergency Management Commission will be tasked with initiating the review, evaluation, and maintenance of the plan. The Emergency Management Commission will be in charge of making it a priority to update the Audubon County Multi- Jurisdictional Hazard Mitigation Plan. The Audubon County Multi-Jurisdictional Hazard Mitigation Plan will be evaluated once a year for potential changes, and to maintain compliance with FEMA rules and regulations. If Audubon County, or any individual city, decides to update the plan, the Emergency Management Commission will be responsible to initiate the update. If there is not an update within four years of the plan being adopted, then the process will begin to update the plan. The Emergency Management Commission will coordinate the meeting time and place and will notify the other members of the committee. If a new committee needs to be formed, it should be compromised of representatives of the city government, businesses, citizens, emergency staff, school board, etc. The members of the Emergency Management Commission agree to:

- Meet annually to monitor and evaluate the implementation of the hazard mitigation plan
- Act as a forum for hazard mitigation issues
- Disseminate hazard mitigation ideas and activities to all members of the committee
- Pursue the implementation of hazard mitigation actions that are included in the plan
- Monitor any sources of possible funding to help the jurisdictions implement the plan's recommended actions
- Monitor and assist in implementation and update of this plan
- Inform and gather input from the public

The primary duty of the Audubon County Emergency Management Commission, in relation to maintaining and updating this plan, is to see that the plan is successfully carried out and report to the Board of Supervisors, and to make information available to the public regarding the status of the plan and the progress of hazard mitigation actions.

Implementation Policies and Issues

The hazard mitigation planning team was created to develop the mitigation plan and guide the plan preparer. The planning team should not formally end with the approval of the plan. The planning team should become a watchdog to help local officials move the plan's goals forward and should take a key role in implementing projects. Members can help remind public officials of that particular year's mitigation strategy and possible funding options and can volunteer in the implementation process for certain actions. The team and local governments may participate in the process and engage regional organizations, state agencies, colleges, schools, NGOs, and churches via memoranda of agreement.

Throughout the mitigation plan, there are gaps in data that are outlined in the plan. In addition to specific mitigation actions in this chapter, it is important that the Audubon County jurisdictions review this plan periodically as the County prepares for the next five-year update of this Plan. This process would help satisfy FEMA Region VII requirements. Missing data should be found and included by the next major update.

This hazard mitigation plan is a guide for future policy planning for participating jurisdictions in the county. The plan considers demographic trends and projections, community background information, current and future political decisions, and overall important goals and objectives for the county's jurisdictions. The goals and objectives have been developed to reflect the general consensus of the county's Hazard Mitigation Planning team, the broad range of elected officials, and the citizenry of the county. These recommendations have been developed to look five-plus years into the future with the expectation that periodic updates will occur in order to reflect changes within the county.

The success of this plan will require the support of the emergency management commission/agency, elected officials, department heads, and volunteers (including civic groups, academia, and general citizens). Cooperation from the public and private sectors will allow implementation of the recommendations that will provide long-term benefits for the entire county and each jurisdiction. By implementing these recommendations, the jurisdictions will be furthering other civic goals also.

Simply listing a project or discussing an issue does not cause anything to be done about it. It is vital that the jurisdictions make a sustained effort to implement projects, actions, and policies as outlined in this plan. Reviewing the text intermingled among the tables and lists also provides ideas on how to carry out the plan and meet mitigation goals. This chapter also provides more details about the regular activities involved in carrying out this plan and preparing for future planning efforts.

The following ideas should be kept in mind when considering how the plan should be implemented.

- Funding and resources are very limited due to the small population size, modest land value and tax base, and other funding obligations that make it impossible to save for long-term emergency needs.
- Audubon County has a limited number of volunteers and support agencies to handle either mitigation projects or response needs. Funding is too limited to provide proper training and equipment, and volunteers do not have the time to undertake the necessary training. Many volunteers and staff wear multiple "hats" and cannot meet all the demands when hazards occur.
- Many members of the public are apathetic to hazards and particularly to the sustained efforts necessary to mitigate them. Some citizens and public officials do not properly respect the need for mitigation planning, the risks the county face, and the roles they have in the process. Few members of the general public have attended planning meetings.
- Information and data to bring about detailed hazard analysis and the analysis of possible mitigation actions is often lacking on a local level.
- Local jurisdictions have limited legal authority to implement some possible mitigation actions.
- Because prioritization is needed in order to effectively use limited resources, it is important that the jurisdictions perform studies on community infrastructure and services provided.
- Because of the risk of failure of investments in key hazard areas where the area is defined, the jurisdictions should consider a policy to prohibit or limit public expenditures for capital improvements in such areas.
- Small towns should use mitigation before hazards occur as a means to be prepared for the fact that, in a widespread hazard, resources are not likely to be available to them until larger jurisdictions are served.

Annual Review and Plan Maintenance Process

The DMA of 2000 suggests that each local jurisdiction review the plan annually. Principally, each jurisdiction's government body and key staff should review the actual implementation plan for that jurisdiction. A review of capabilities, goals/objectives, and proposed actions is particularly warranted. It is important that the review notes and suggested changes be made at a public meeting and records are kept. If any of the changes relate to a project that is being submitted to FEMA, such as through a PDM, FMA, or HMGP application, the jurisdiction must adopt the changes at a council or supervisor meeting to make the changes officially part of the plan and thus eligible for mitigation funding. The local jurisdictional body, such as city council, board of supervisors, or school board, is responsible for ensuring reviews are completed.

The public should be invited to all formal meetings where the plan is discussed and possible changes can be made. Local media should be used to alert the public. Each jurisdiction is responsible for review of the parts of the plan relevant to the said jurisdiction.

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or
- Increased vulnerability as a result of new development (and/or annexation)

The annual reviews and updates to this plan will:

- Consider changes in vulnerability due to action implementation
- Document success stories where mitigation efforts have proven effective
- Document areas where mitigation actions were not effective
- Document any new hazards that may arise or were previously overlooked
- Incorporate new data or studies on hazards and risks
- Incorporate new capabilities or changes in capabilities
- Incorporate growth and development-related changes to inventories, and
- Incorporate new action recommendations or changes in action prioritization

In order to best evaluate the mitigation strategy during plan review and update, the participating jurisdictions will follow the following process:

- A representative from the responsible office identified in each mitigation action will be responsible for tracking and reporting the action status on an annual basis to the jurisdictional HMPC member and providing input on any completion details or whether the action still meets the defined objectives and is likely to be successful in reducing vulnerabilities.
- If the action does not meet identified objectives, the jurisdictional HMPC member will determine what additional measures may be implemented, and an assigned individual will be responsible for defining action scope, implementing the action, monitoring success of the action, and making any required modifications to the plan.
- As part of the annual review process, the Audubon County Emergency Management Coordinator will provide the updated mitigation strategy with current status of each mitigation action to local elected officials of various jurisdictions requesting that the mitigation strategy be incorporated, where appropriate in other planning mechanisms.

Changes will be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities

will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as the planning team deems appropriate and necessary, and as approved by the Audubon County Boards of Supervisors and the governing boards of the other participating jurisdictions.

Opportunities for Publicity

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

Several times the local media can make comments about the effort and successes that may arise:

- Adoption of the mitigation plan
- Receipt of approval by FEMA
- Initiation and completion of tangible mitigation actions or projects
- Update and evaluation meetings and results

Annually, each jurisdiction is to hold at least one public meeting or hearing so that the public can comment on the status of the mitigation plan's implementation and changes that are needed to the plan.

Incorporation into Other Planning Mechanisms

Section 201.6 (c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate.
The planning team is partly responsible to ensure that the public officials are incorporating mitigation actions into relevant plans and planning mechanisms, such as zoning, annexation plans, and bonding proposals. Communities should also include mitigation initiatives as regular line items in community capital or operational budgets to ensure ongoing funding for hazard mitigation initiatives.

The local jurisdictions did not incorporate any of the mitigation actions into existing plans in any formal sense since the previous plan was adopted. However, mitigation ideas were incorporated informally in budget decisions, such as to fund a mitigation action. The jurisdictions commit to improved formal planning efforts in the next five years. Ways each jurisdiction will incorporate this plan can be found in their respective appendix.

Where possible, Audubon County and all other jurisdictions, will consider the findings from this document when updating or creating new planning and operating documents. Examples of planning documents that would benefit from information provided in this plan include, but are not limited to:

- Incorporated City Codes
- Audubon County Comprehensive Plan
- Audubon County Code of Ordinances
- Audubon County Zoning Ordinance
- Other existing and future plans, such as water conservation plans, storm water management plans, and parks and recreation plans

As of the writing of this plan, not all of the above-mentioned plans are in place within Audubon County. It is anticipated that this plan would be used to guide the creation of the documents listed above, if they were to be developed. Some jurisdictions have some documents currently in place, but if the document is to be updated, the hazard mitigation plan should be referenced in the update. In plans that are currently written, utilizing the hazard mitigation plan will be vital when looking to expand and improve the jurisdiction's mitigation to hazards.

Appendix A: Rural Audubon County

Table A.1: Rural Audubon County Risk Assessment

Hazard	Comments
Animal/Plant/Crop Disease	Rural Audubon County is predominately agricultural land. While this land use represents the majority, there have been limited reported losses from animal/plant/crop disease throughout the county in general. Some specialized industries, like the bird farmers have had large impacts due to the bird flu that has impacted large portions of the bird populations. The Ash Borer has caused a large amount of trees to become diseased and die, causing the county conservation to begin to cut these trees down and will need to replace them in the future.
Drought	Drought occurrences have increased across the state, and Audubon County has not been exempt from this hazard. Droughts continue to increase in severity and while there is little warning, this hazard can cause both direct and indirect issues for the county and it's residents.
Earthquake	There have been no instances of earthquake in Audubon County, and the committee feels there will be no instances during the life of this plan.
Expansive Soils	There have been no instances of expansive soils in Audubon County, and the committee feels there will be no instances during the life of this plan.
Extreme Heat	Extreme heat events continue to impact Audubon County. This hazard can and does affect the entire rural county and it's jurisdictions. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body. With one extreme heat event occurring in the past five years, Audubon County is predicted to have at least one event recorded over the life of this plan.
Flash Flood	Since 2018, there have been no recorded instances of flash flooding within Audubon County. While flash floods have little to no warning time, with no recorded instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the county for response to an event. While there were no recorded instances of flash flooding within the last reporting period, the committee believes that with the increased severity of storms, that the county is estimated to experience one to two flash flooding events over the next five years.

Grass/Wild Land Fire	Grass and wild land fires are most commonly field fires or controlled burns that get out of hand. This hazard can pose a large threat to the county as elements out of anyone's control, such as wind direction and speed, can change this hazard from harmless and controlled to out of control in a matter of minutes and can pose a threat to life. Grass/ Wild Land Fires have a high probability of occurring each year with a minimum of ten events anticipated annually.
HAZMAT Incident	Audubon County reported 12 hazardous spills within the last reporting period. Nineteen of the spills posed no threat to humans or the environment. There were six reported spills that threatened the soil, five that caused no threat, and one that threatened the surface water. With this many instances within five years, the committee feels that this hazard poses a threat to the county and mitigation actions should be strongly considered and implemented to prevent any further instances.
Human Disease	Iowa and more specifically Audubon County is still feeling the effects of the COVID-19 pandemic. The pandemic has reignited the need to plan for future outbreaks and examine the county's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.
Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the county to protect lives and property. The most likely infrastructure failure within Audubon County would be structural failure of either bridges or roadways. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.
Levee/Dam Failure	Of the eighty-five Audubon County dams in the inventory, two are considered to be significant hazard dams and two are considered to be high hazard dams. There have been no known occurrences of dam failure in Audubon County. Sound design, quality construction, and continued inspections and repairs reduce the probability of dam failure. While there have been no instances of failure in the past, with the age and classifications of the dams in the county, this hazard should be high priority.
Radiological	During the previous planning period, there were no instances of Radiological Incident in Audubon County, and the committee does not anticipate any happening in the next planning period. If an incident were to occur, the committee feels it would be a small, contained situation that would not threaten the county as a whole.
River Flooding	Large portions of Audubon County are located within flood zones. While there is a large amount of land in the flood zones, the only flooding instance since 2018 was recorded near Gray and $100,000 in property damage was reported. While there have been limited instances of river flooding in the last reporting period, it is important that the County stay vigilant and plan for river flooding instances. Flooding instances have increased within the county, and is anticipated that at least one flood event will happen annually within Audubon County.
Severe Winter Storm	Severe Winter Storms continue to impact Audubon County. Examining the past history and climate change, the county estimates that there will be a minimum of two severe winter storm events each year. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within Audubon County. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the county.

Terrorism	There have been no instances of terrorism in Audubon County during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the county and impact all parts of the county. While they are frequent, most storms pose no threat to life, crops, or property. This hazard is prevalent in the county but is normally not severe in nature.
Tornado	Audubon County has experienced three tornadoes in the recent past. Two of these were classified as EF1 tornadoes, and one was classified as an EF0 tornado. While damage from these tornadoes was limited, it is important for the county to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. As past instances have led the county to anticipate a minimum of one tornado a year, preparing the public and county is vital to ensuring there is no loss of life. Tornadoes can impact all portions of Audubon County.
Transportation Incident	Speed limits on the majority of Audubon County's paved roads is set to 55 miles per hour and traffic incidents at these speeds can cause damage to property and life. The committee anticipates that this hazard will effect the county in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused large amounts of reported damage to properties. These storms are not limited to small impact areas and can affect the entire county. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Audubon County prompting the community to prepare more effectively for these hazards. At a minimum, Audubon County anticipates at least one high wind event annually.

Loss Estimates

Table A.2: Rural Audubon County Maximum Building and Population Exposure

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	1,366	$334,816,442	2,339
Commercial	66	$13,813,115	
Industrial	5	$38,068,093	
Residential	1,929	$58,955,986	

It is unlikely that a jurisdiction can determine the impact any hazard will have. If a hazard were to impact the entire county, the numbers in table A.2 shows the number of people who would be affected and the maximum number of structures and their value. If this type of event were to occur, a shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability or even death.

Table A.3: Rural Audubon County Limited Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	342	$83,704,111	585
Commercial	17	$3,453,279	
Industrial	2	$9,517,023	
Residential	482	$14,738,997	

The following hazards were determine to have a limited impact on Audubon County were they to occur.

Dam and Levee Failure
Expansive Soils
Extreme Heat
Flash Flood
Grass or Wild Land Fire
HAZMAT Incident
River Flooding
Thunderstorm/Lightning/Hail
Tornado

A shutdown of some facilities and services could last more than a week and any injuries/illnesses would not result in permanent disability. It is estimated that 25% of the County would be impacted.

Table A.3: Rural Audubon County Limited Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	342	$83,704,111	585
Commercial	17	$3,453,279	
Industrial	2	$9,517,023	
Residential	482	$14,738,997	

The following hazards were determine to have a critical impact on Audubon County were they to occur.

Animal/Plant/Crop Disease
Drought
Earthquake
Human Disease
Infrastructure Failure
Severe Winter Storms
Transportation Incident
Windstorm

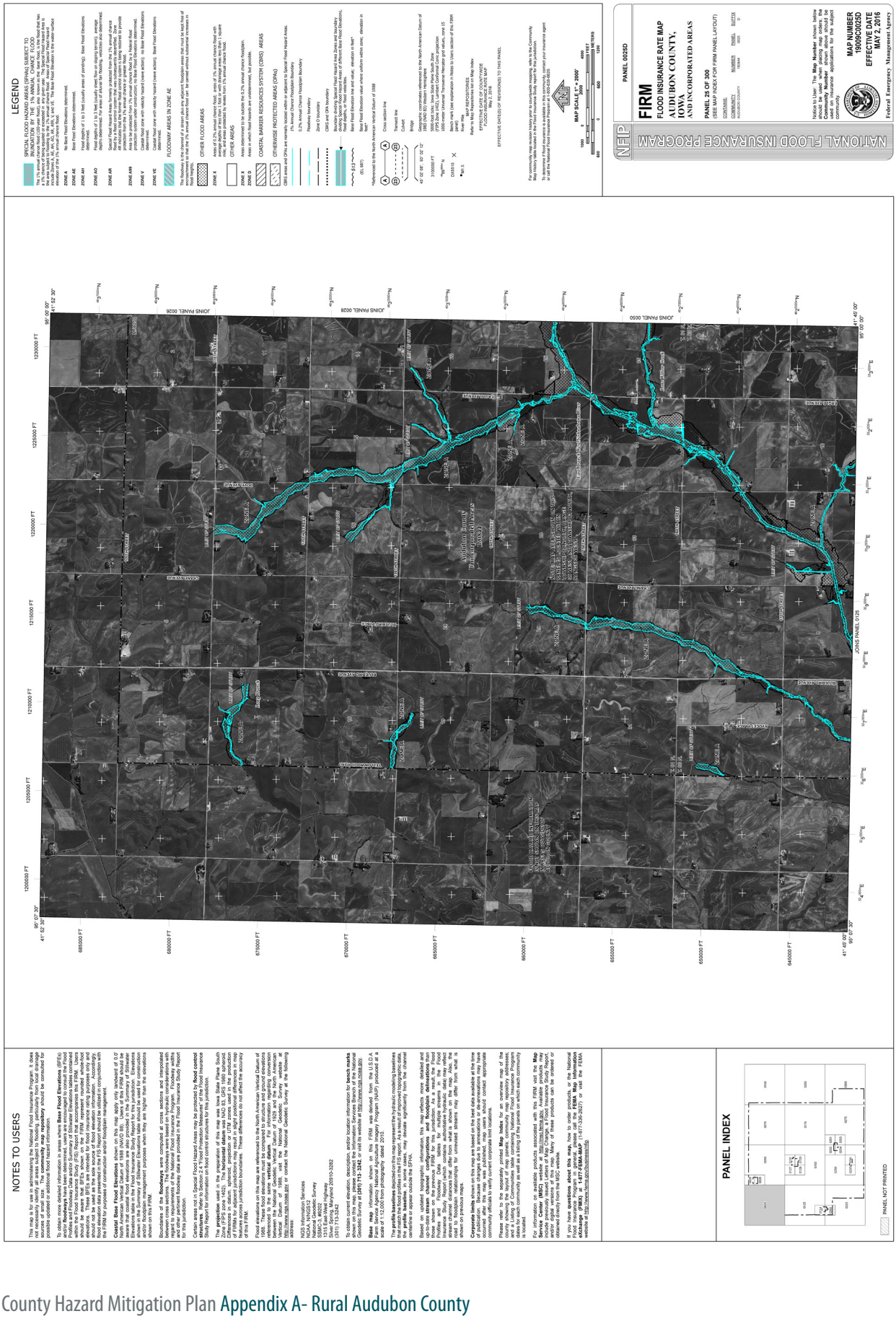
A shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability. It is estimated 50% of the County would be impacted.

Table A.4: Rural Audubon County Critical Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	683	$167,408,221	1,170
Commercial	33	$6,906,558	
Industrial	3	$19,034,047	
Residential	965	$29,477,993	

Flood Maps

Source: FEMA Flood Map Service Center



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

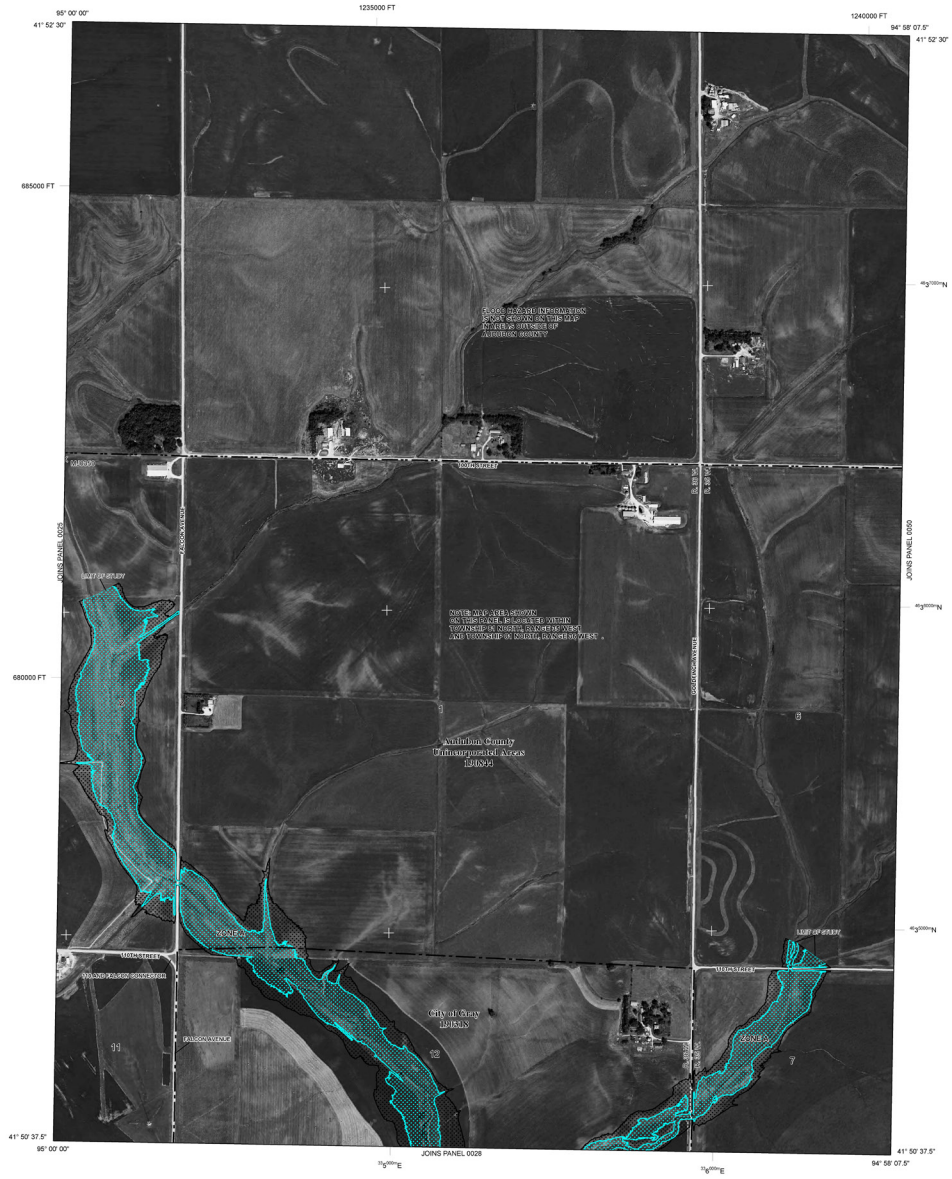
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 Base Flood Elevation line and value; elevation in feet*
(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A A Cross section line
23 23 Transect line
Culvert
Bridge
43° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
4390000 N 1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0026D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 26 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0026	D
GRAY, CITY OF	190318	0026	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0026D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

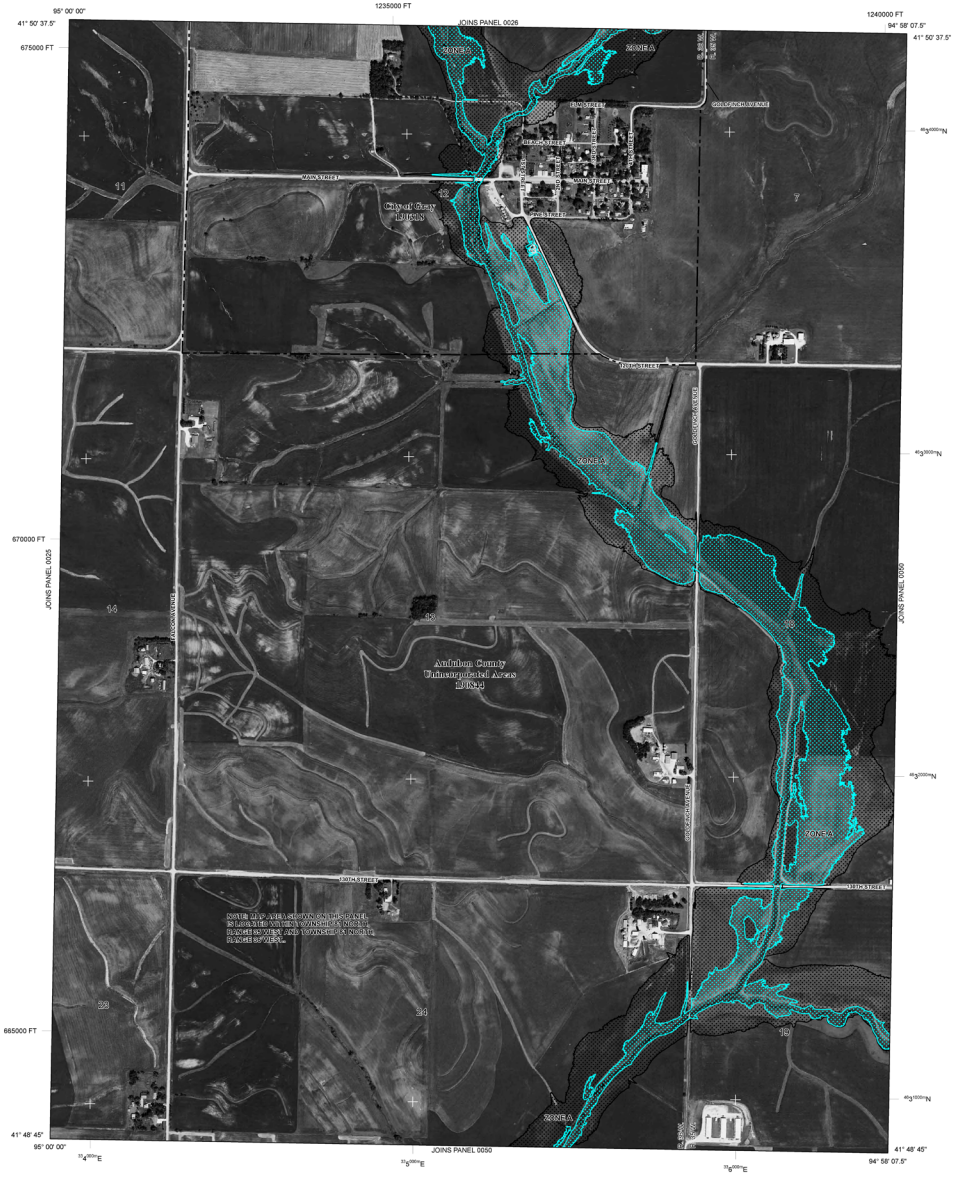
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

4638000 N — 1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

PANEL 0028D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 28 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190044	0028	D
EXIRA, CITY OF	190318	0028	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0028D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

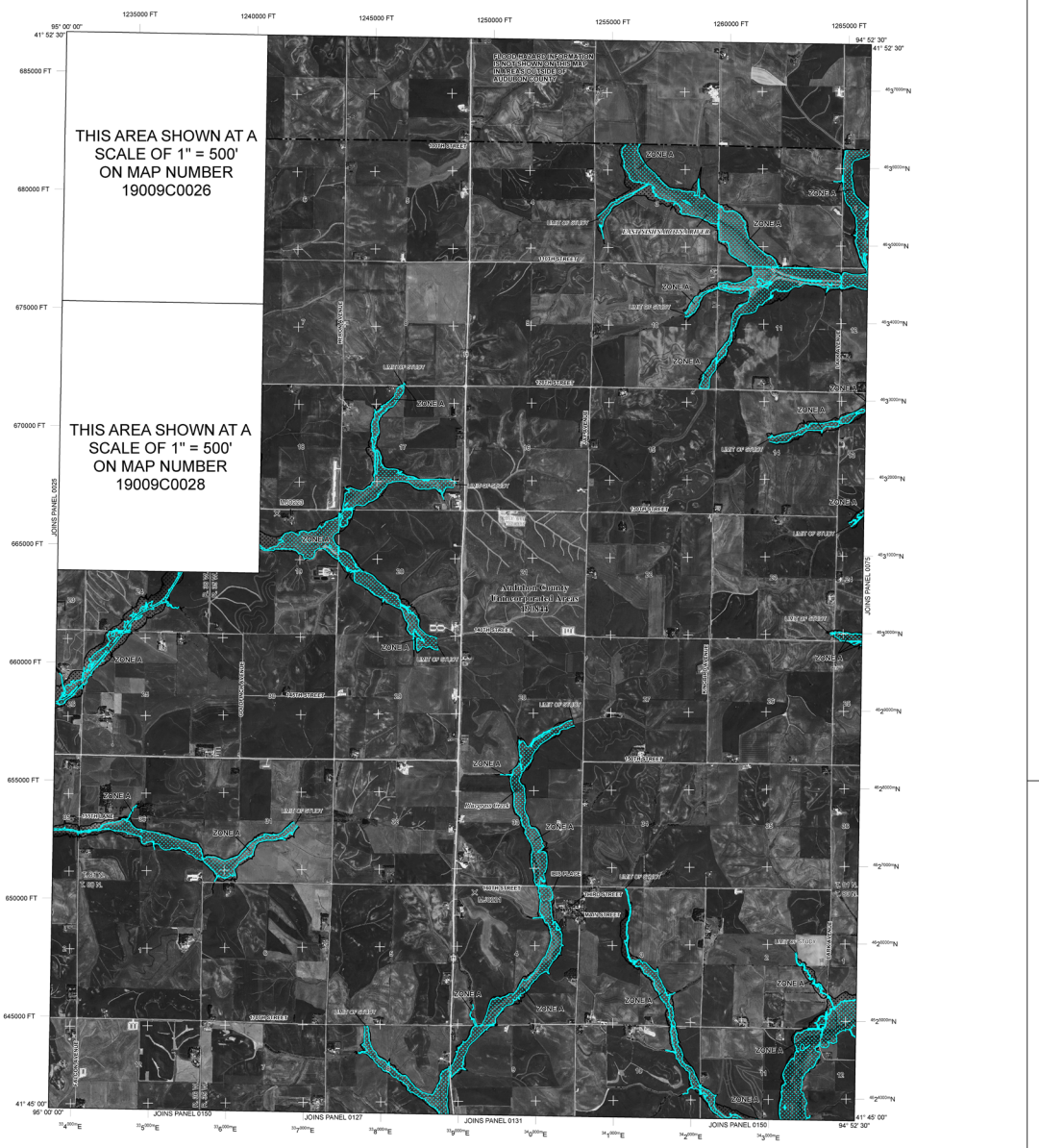
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
Culvert
Bridge
43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0050D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 50 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0050	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0050D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey **at (301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

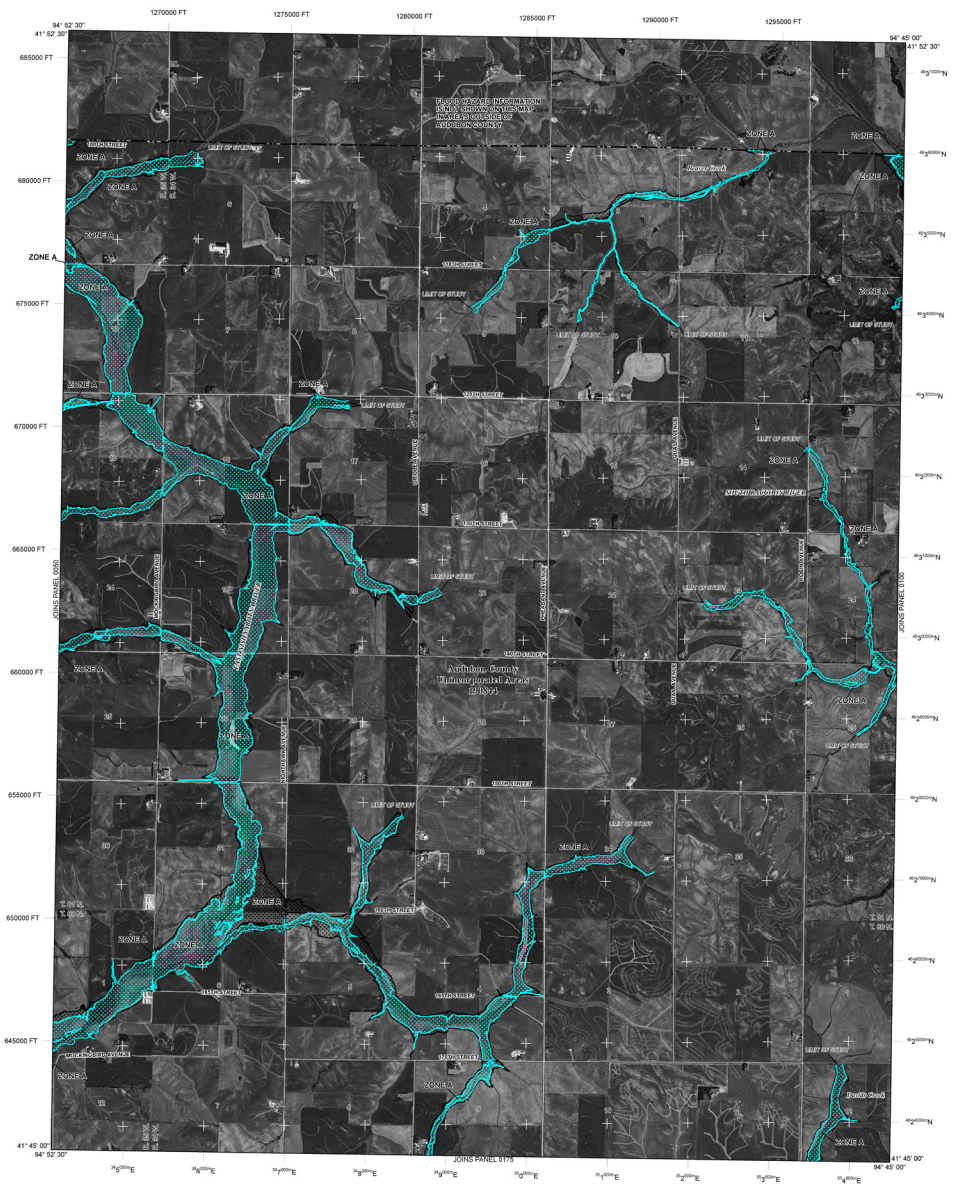
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4990000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0075D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 75 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0075	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0075D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

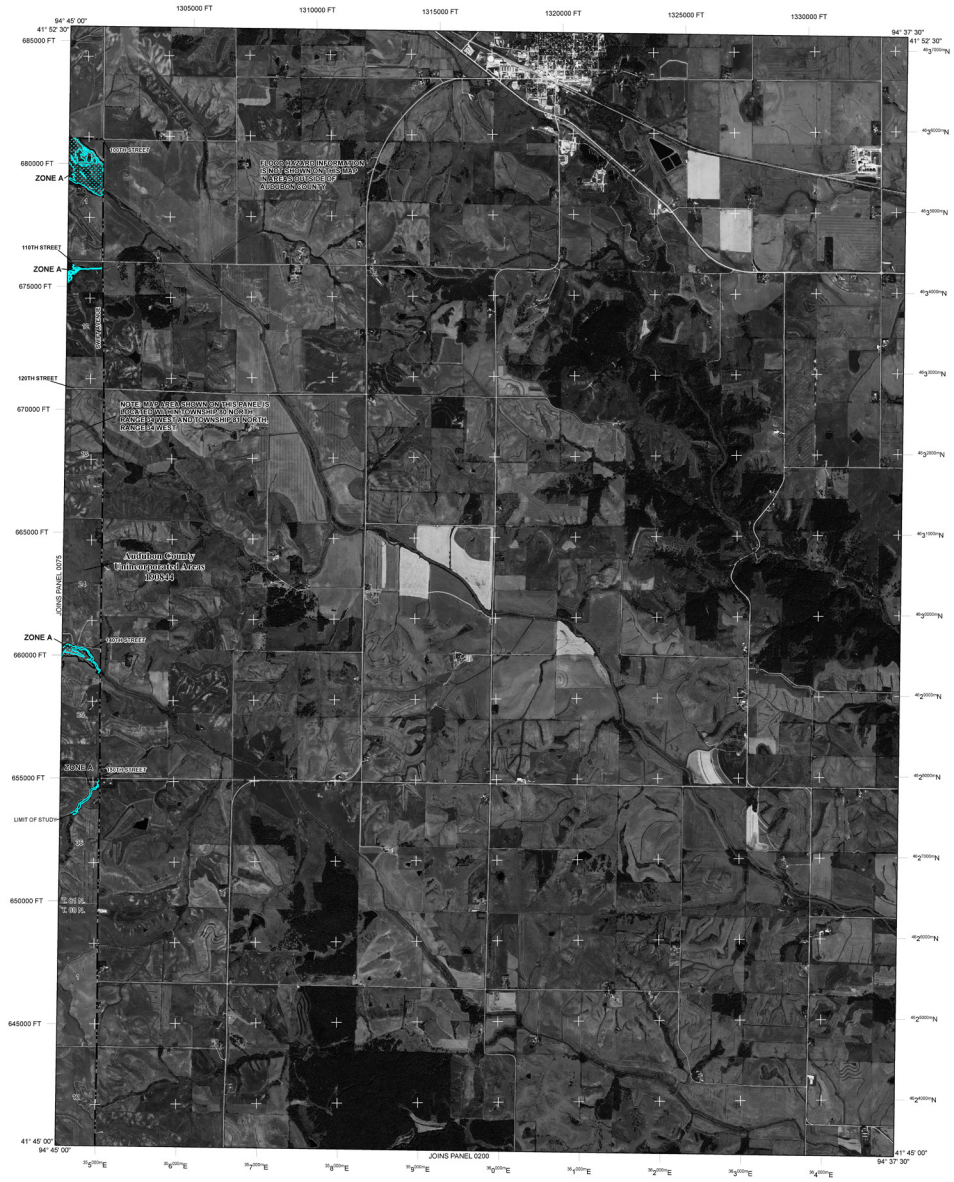
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
Culvert
Bridge
43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0100D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 100 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0100	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0100D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

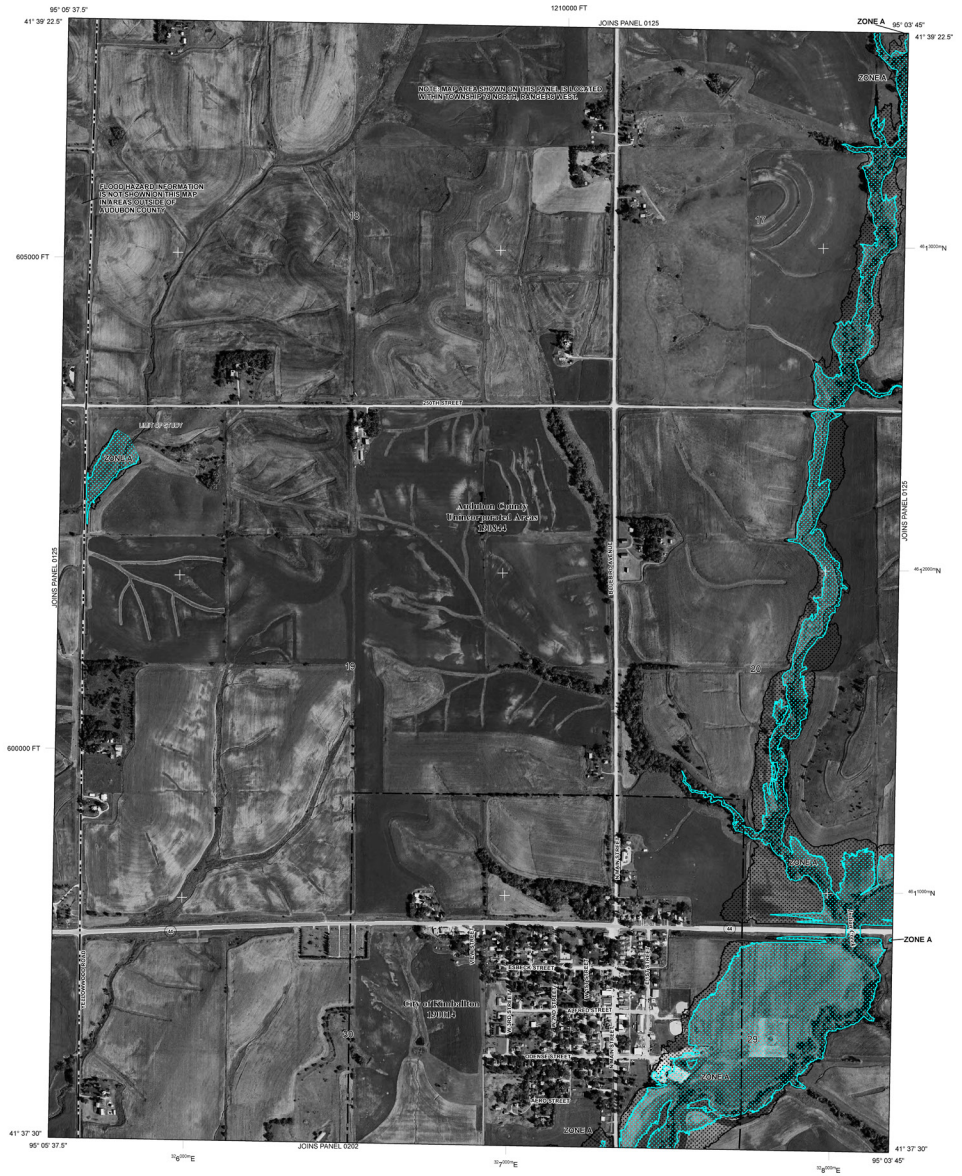
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A–A Cross section line
- 23–23 Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4619000mN 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0114D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 114 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190944	0114	D
KIMBALLTON, CITY OF	190014	0114	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0114D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

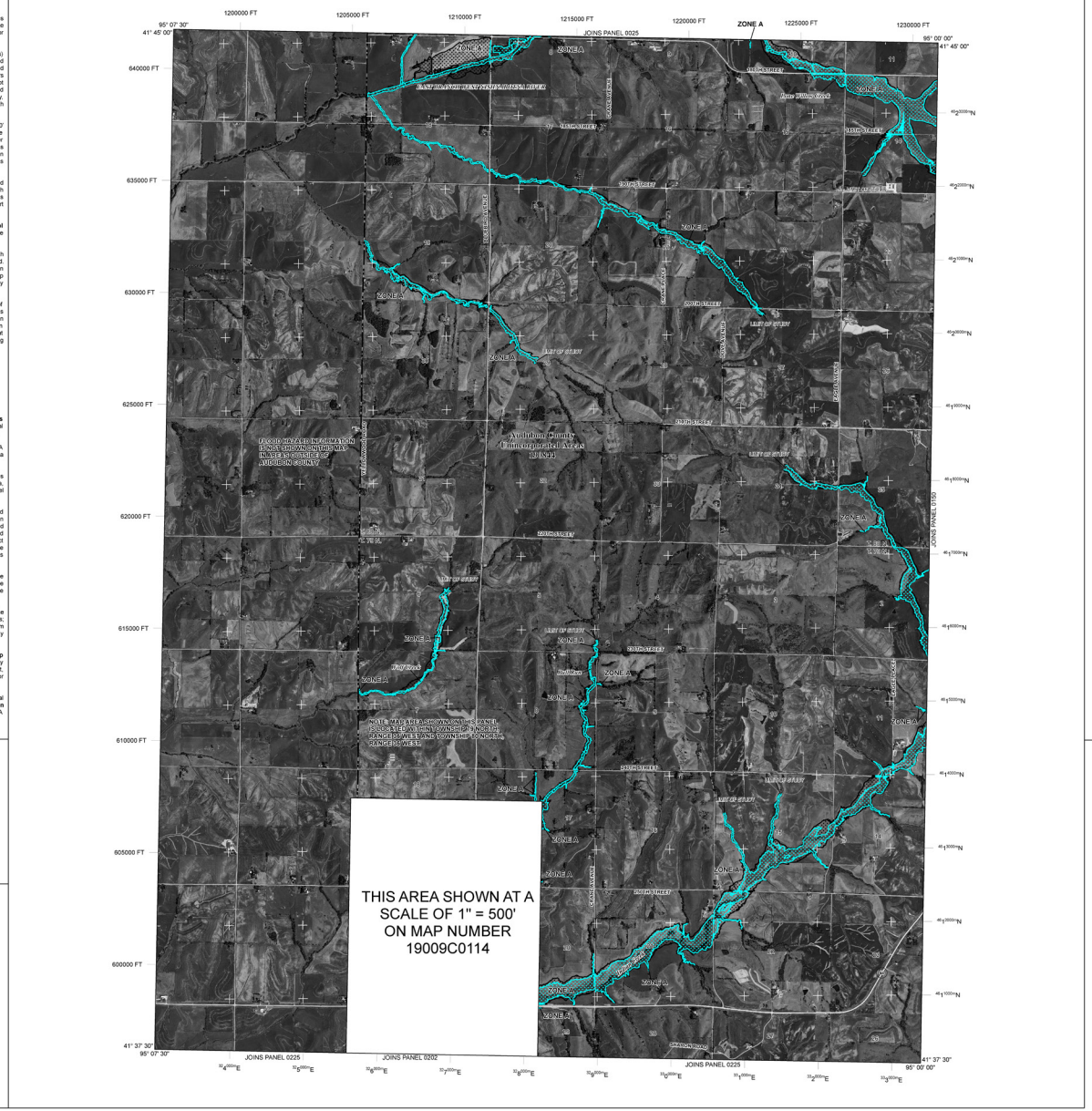
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A Cross section line

23 — 23 Transect line

Culvert

Bridge

43° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0125D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 125 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0125	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0125D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

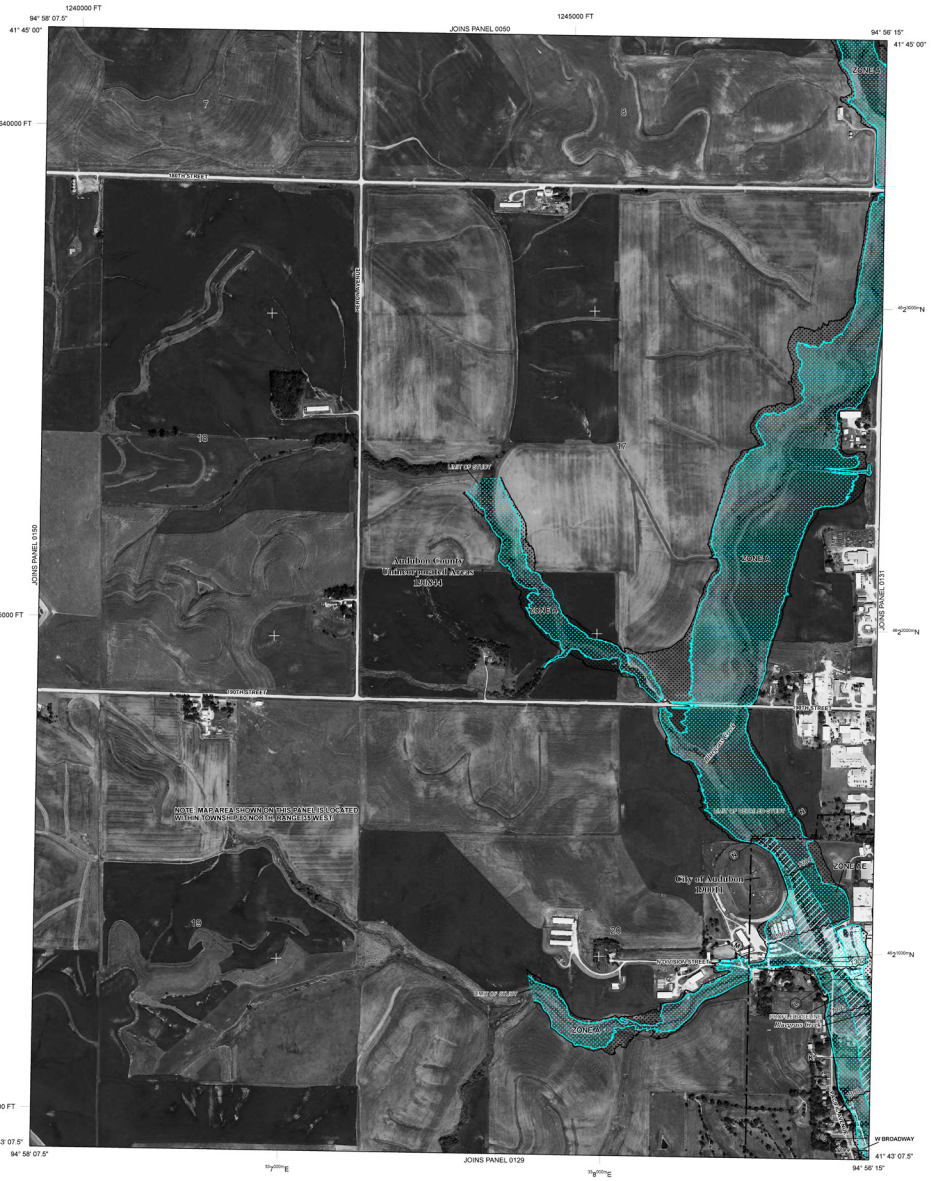
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4990000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

PANEL 0127D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 127 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

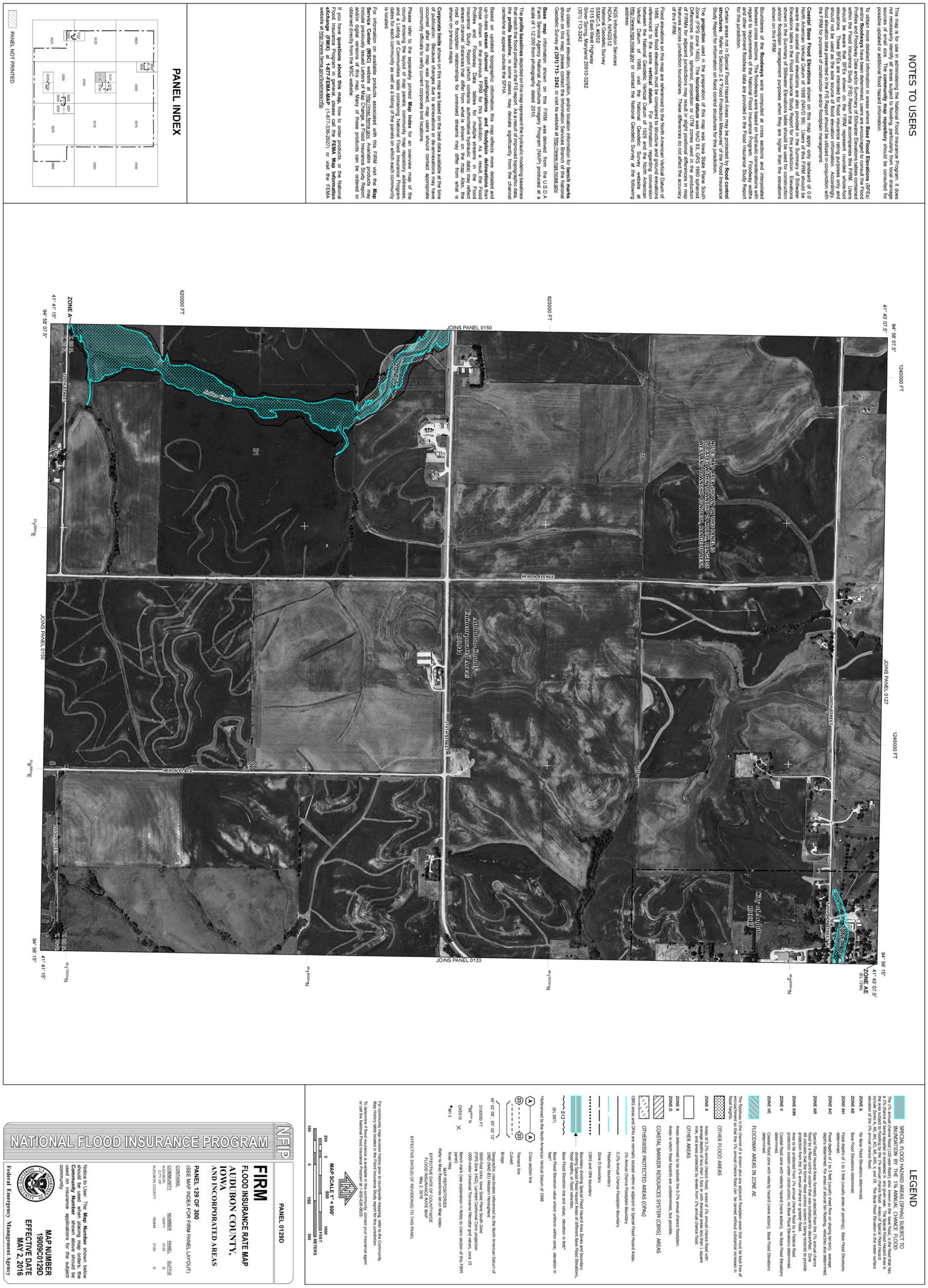
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON, CITY OF	190111	0127	D
AUDUBON COUNTY	190044	0127	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0127D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency


NOTES TO USERS
PANEL INDEX
LEGEND
JOINS PANEL 0150
JOINS PANEL 0127
JOINS PANEL 0133
HERON AVENUE
ZONE A
ZONE AE
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0129D
FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS
PANEL 129 OF 300
MAP NUMBER 19009C0129D
EFFECTIVE DATE MAY 2, 2016
Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713 - 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

Culvert

Bridge

43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

4660000 N — 1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

PANEL 0131D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 131 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON, CITY OF	190011	0131	D
AUDUBON COUNTY	190844	0131	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0131D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

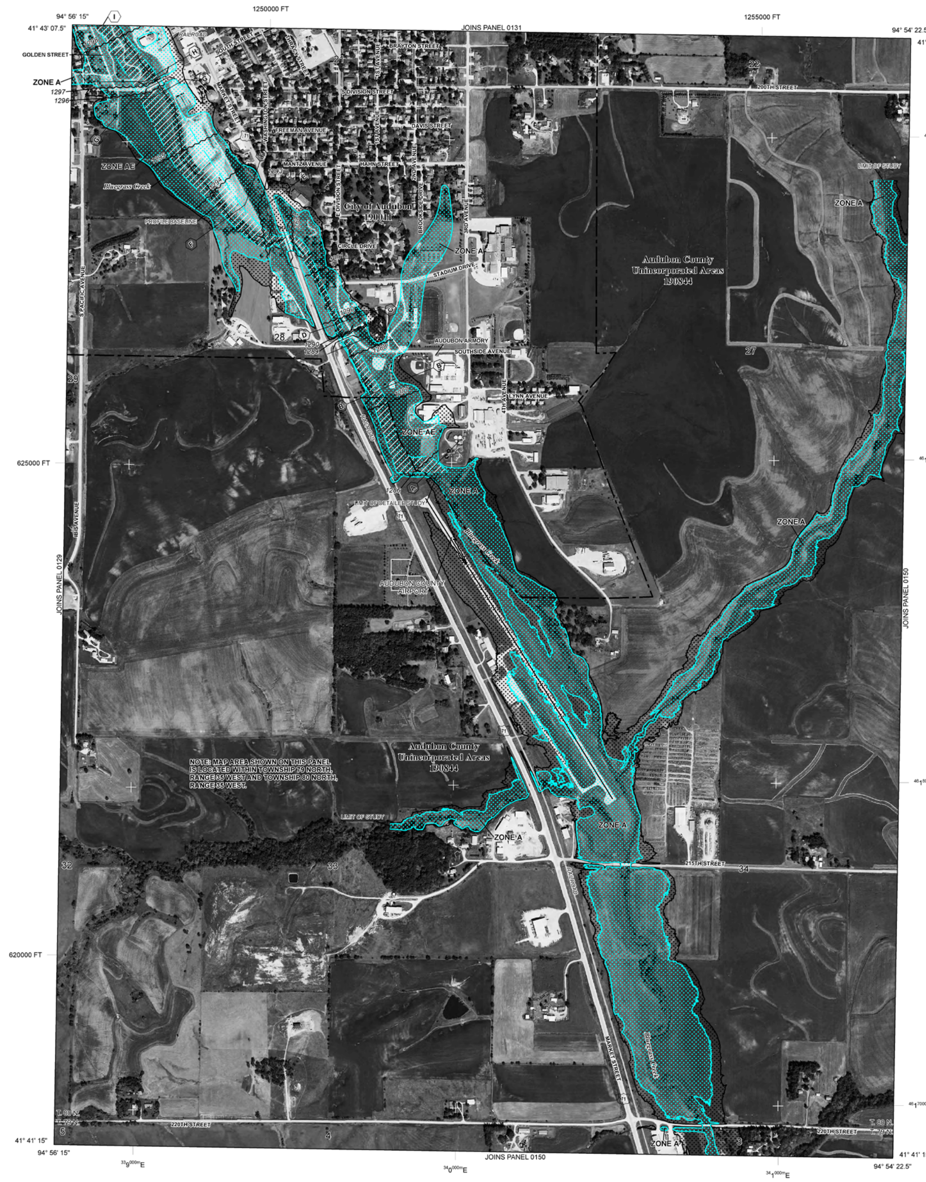
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A: Cross section line
23 - - - 23: Transect line
Culvert
Bridge
45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
$^{49}89^{000m}$ N — 1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0133D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 133 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON, CITY OF	190011	0133	D
AUDUBON COUNTY	190844	0133	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0133D

EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

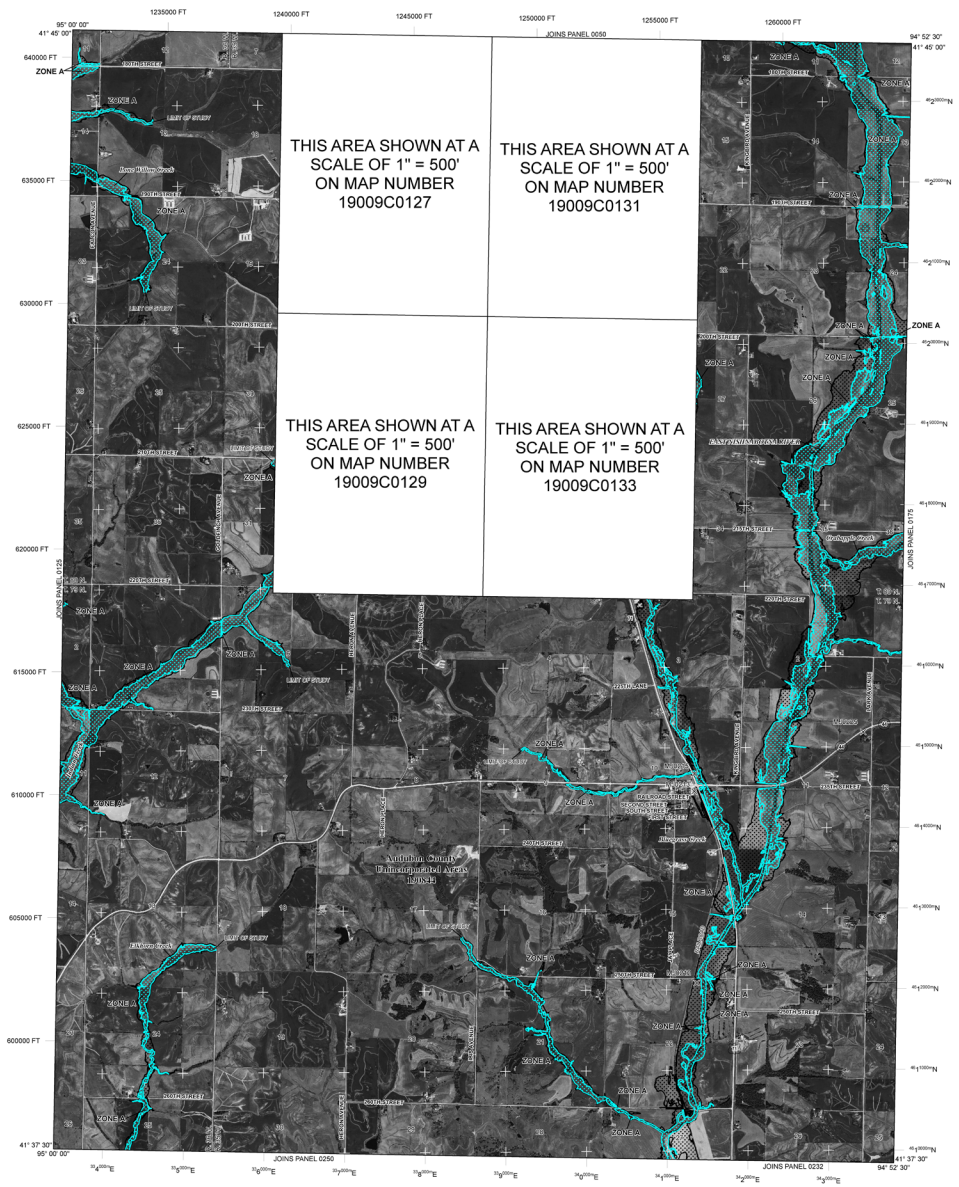
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4656000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0150D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 150 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0150	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0150D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

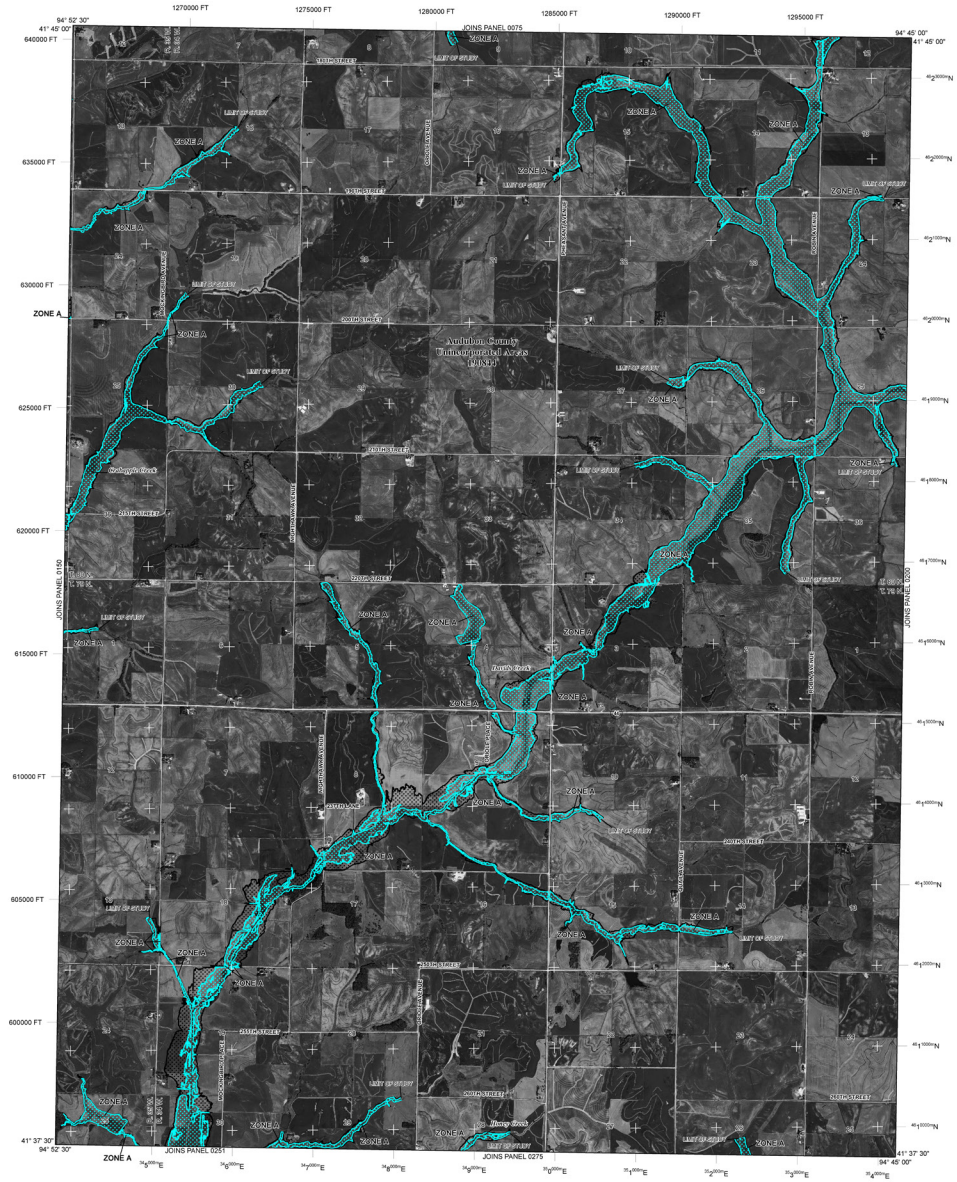
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4490000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0175D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 175 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0175	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0175D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

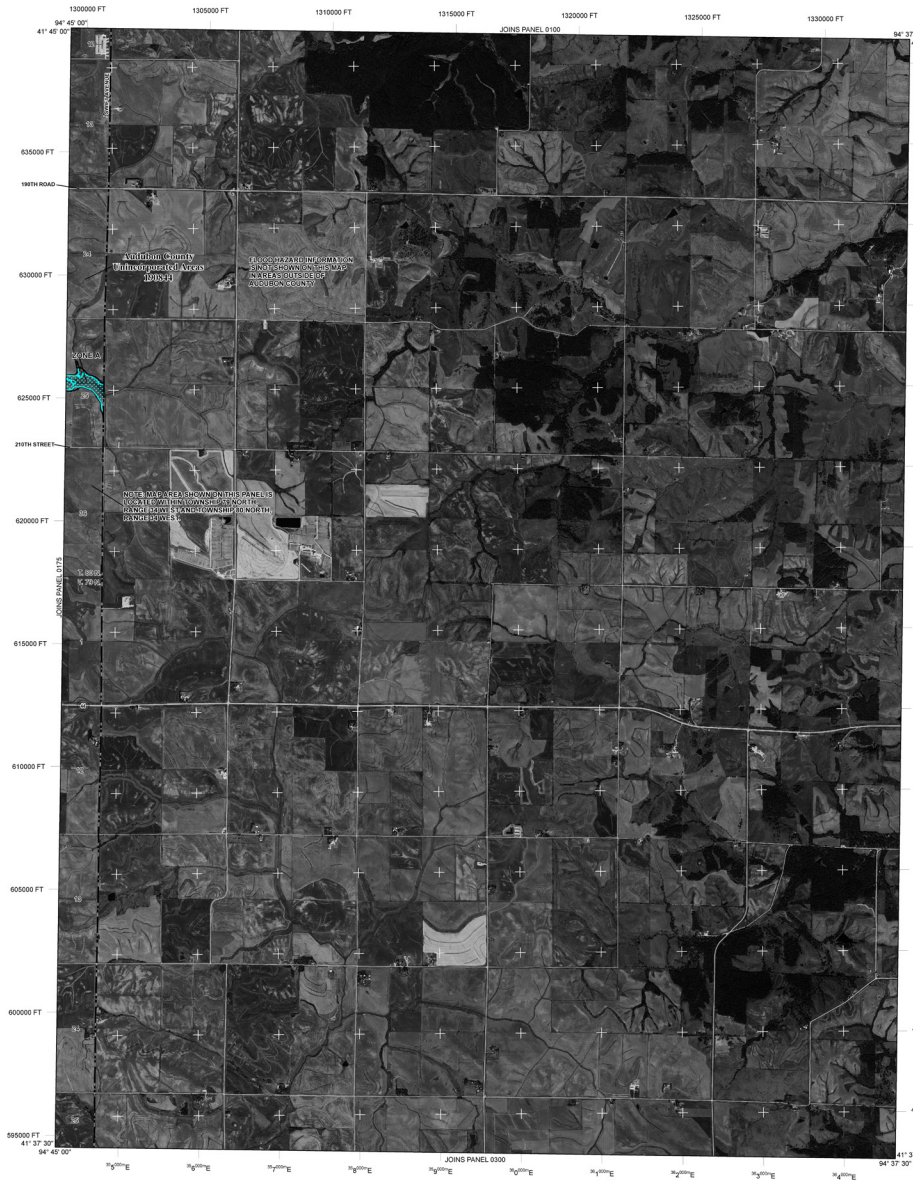
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
Culvert
Bridge
45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
4990000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0200D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 200 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0200	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0200D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

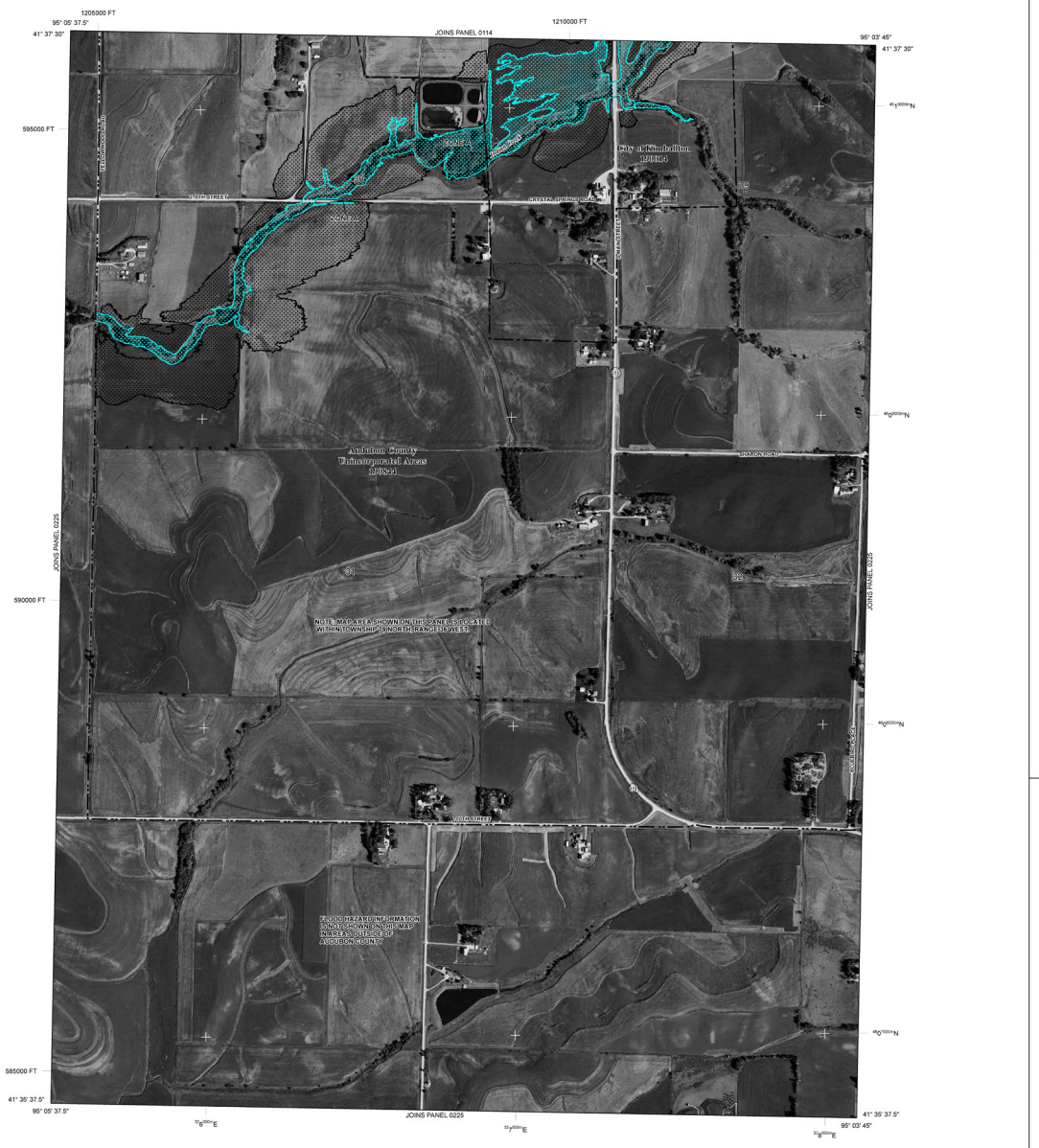
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A–A Cross section line
- 23–23 Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT / 5000000 FT N 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection / 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 / BM 5 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 0202D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 202 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0202	D
KIMBALLTON, CITY OF	190014	0202	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0202D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

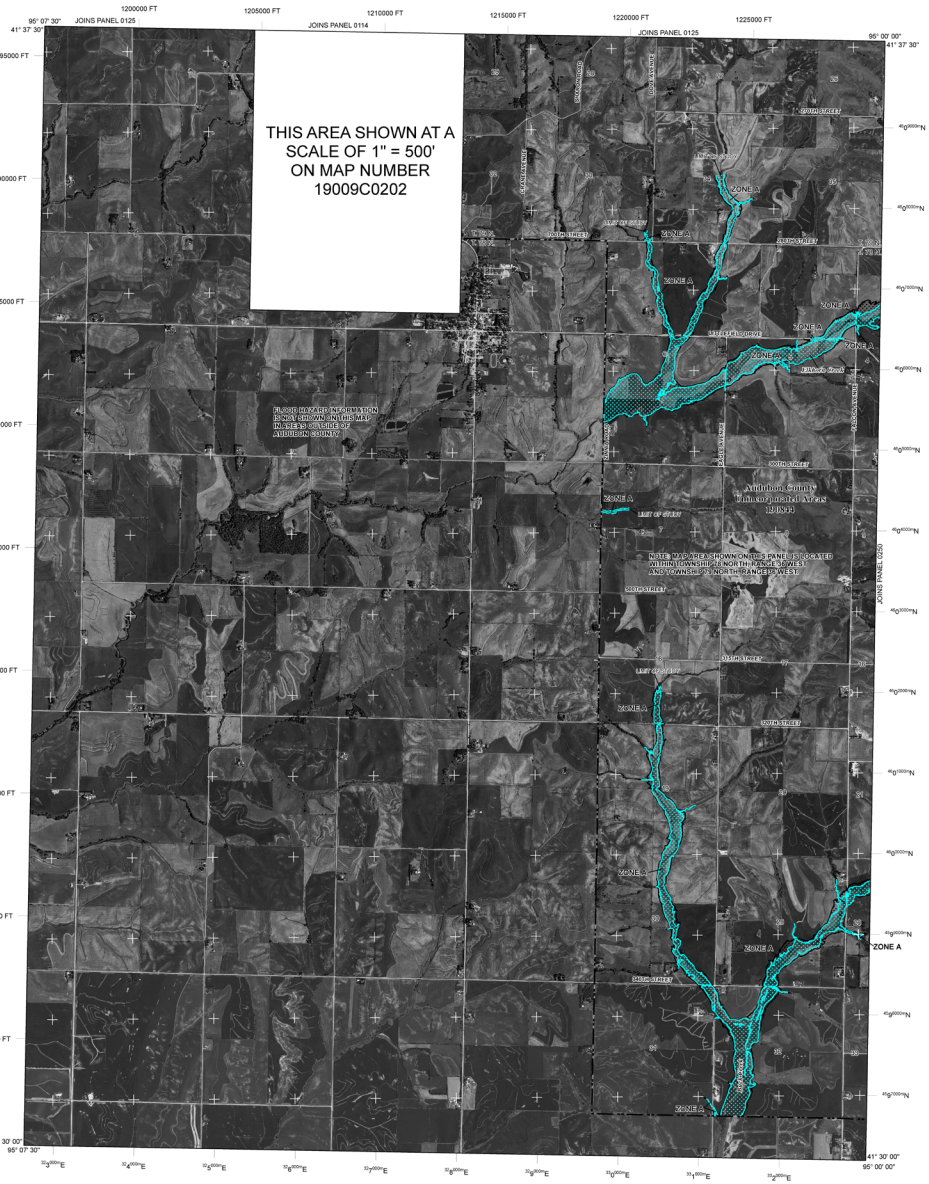
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
Culvert
Bridge
43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
5000000 M — 1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0225D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 225 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0225	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0225D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

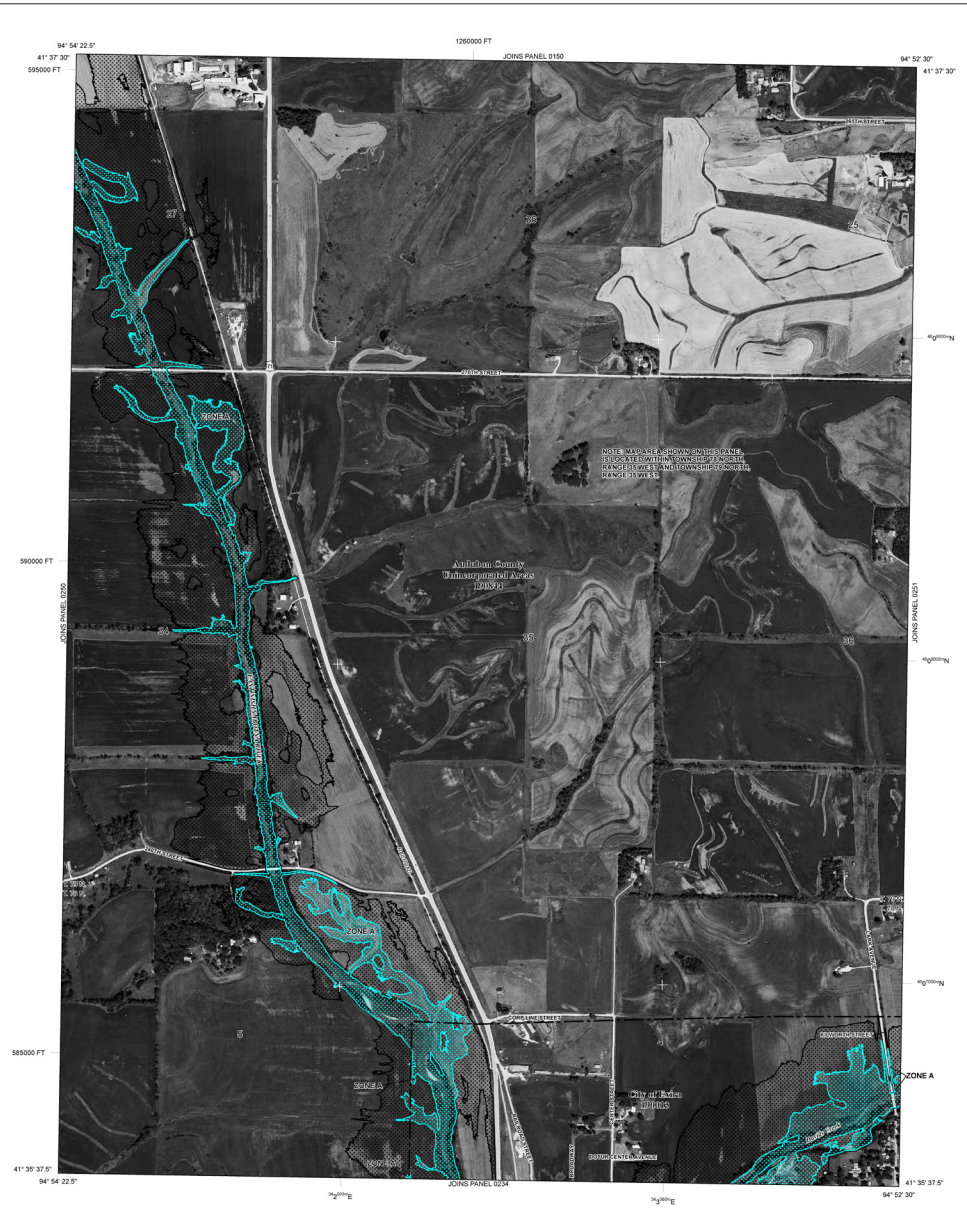
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A / A — Cross section line
- 23 / 23 — Transect line
- Culvert
- Bridge
- 43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4579000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0232D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 232 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

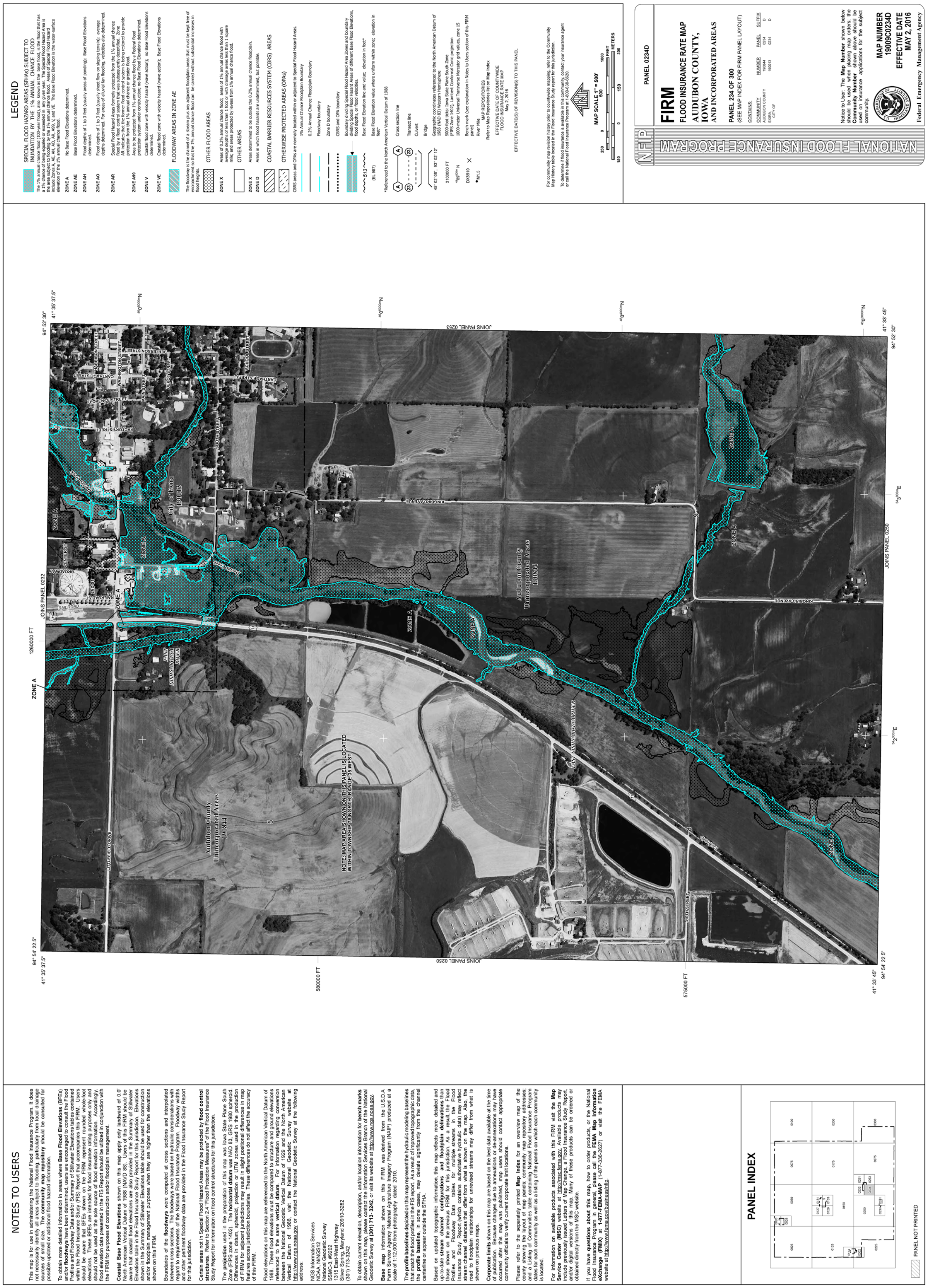
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0232	D
EXIRA, CITY OF	190013	0232	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0232D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency


NOTES TO USERS
LEGEND
PANEL INDEX
FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY,
IOWA
AND INCORPORATED AREAS
PANEL 234 OF 300
PANEL 0234D
NATIONAL FLOOD INSURANCE PROGRAM
MAP NUMBER
19009C0234D
EFFECTIVE DATE
MAY 2, 2016
Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A ⟷ A Cross section line
- 23 ⟷ 23 Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4990000 N 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0237D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 237 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190944	0237	D
BRAYTON, CITY OF	190903	0237	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0237D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

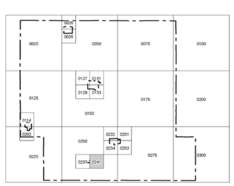
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX



PANEL NOT PRINTED

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - 23	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT	5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
4989000m N	1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0241D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA
AND INCORPORATED AREAS

PANEL 241 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0241	D
BRAYTON, CITY OF	190920	0241	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0241D

EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

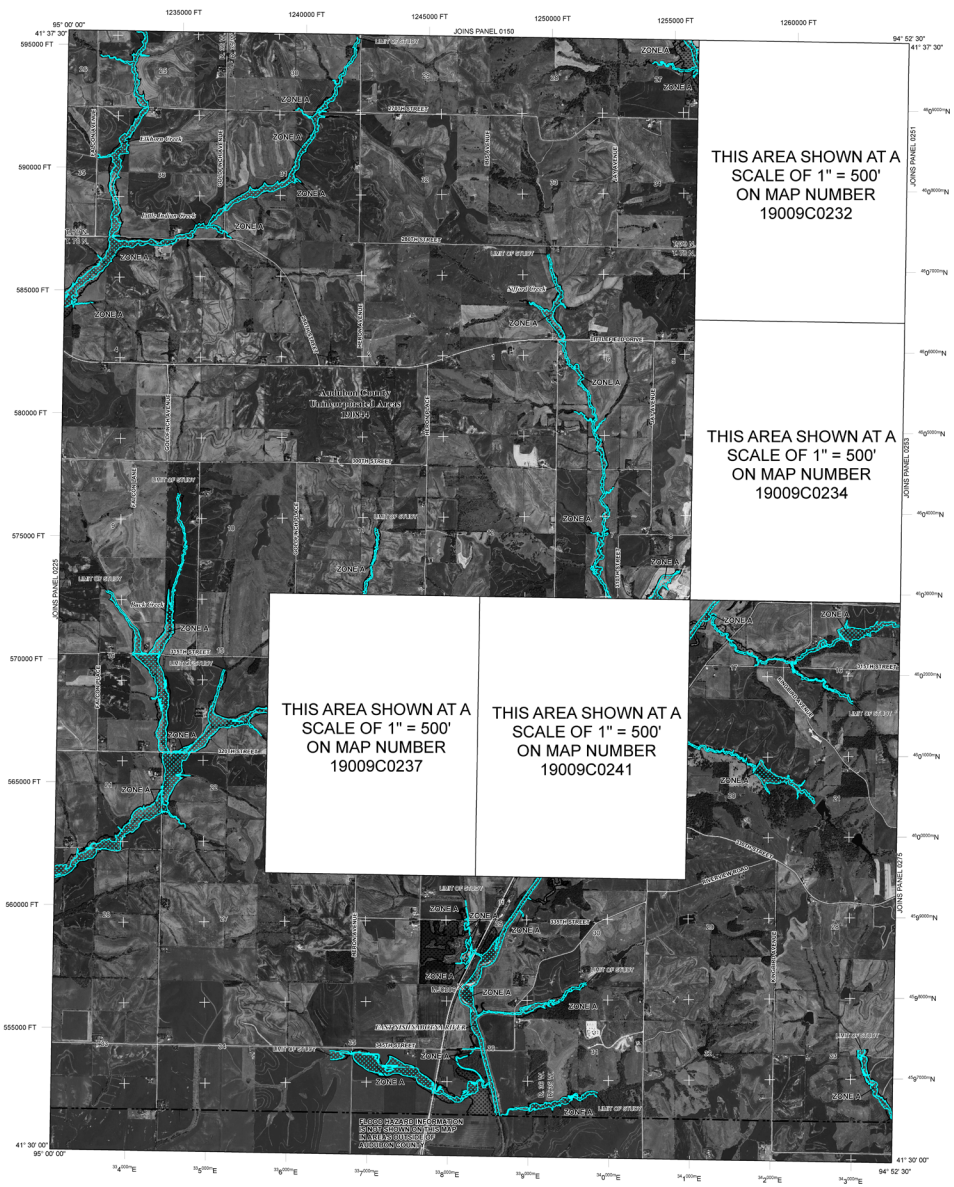
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0250D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA
AND INCORPORATED AREAS

PANEL 250 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0250	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0250D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey **at (301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

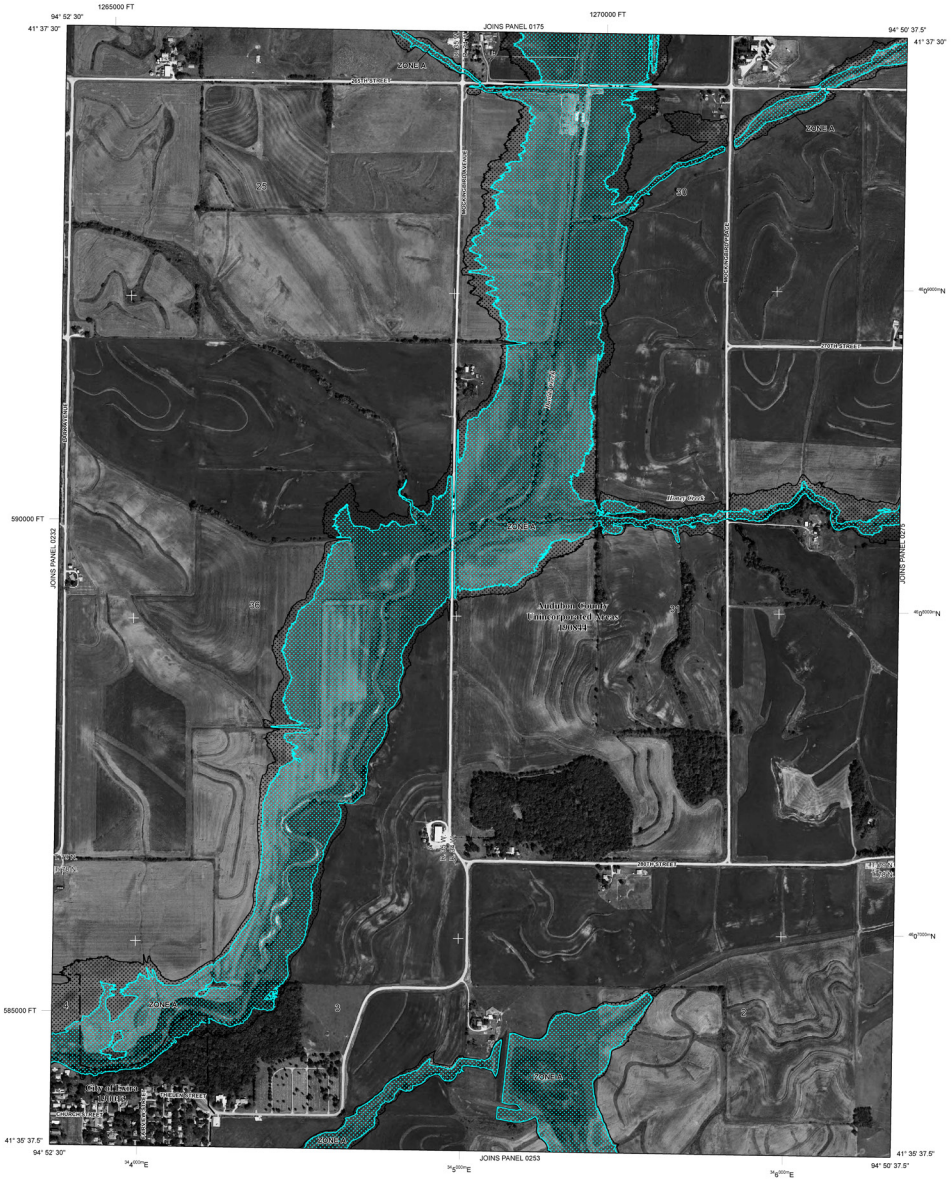
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
Culvert
Bridge
43° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
4640000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0251D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 251 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0251	D
EXIRA, CITY OF	190013	0251	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0251D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency


NOTES TO USERS
PANEL INDEX
LEGEND
JOINS PANEL 0234
JOINS PANEL 0275
JOINS PANEL 0251
ZONE A
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0253D
FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 253 OF 300
MAP NUMBER
19009C0253D
EFFECTIVE DATE
MAY 2, 2016
Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

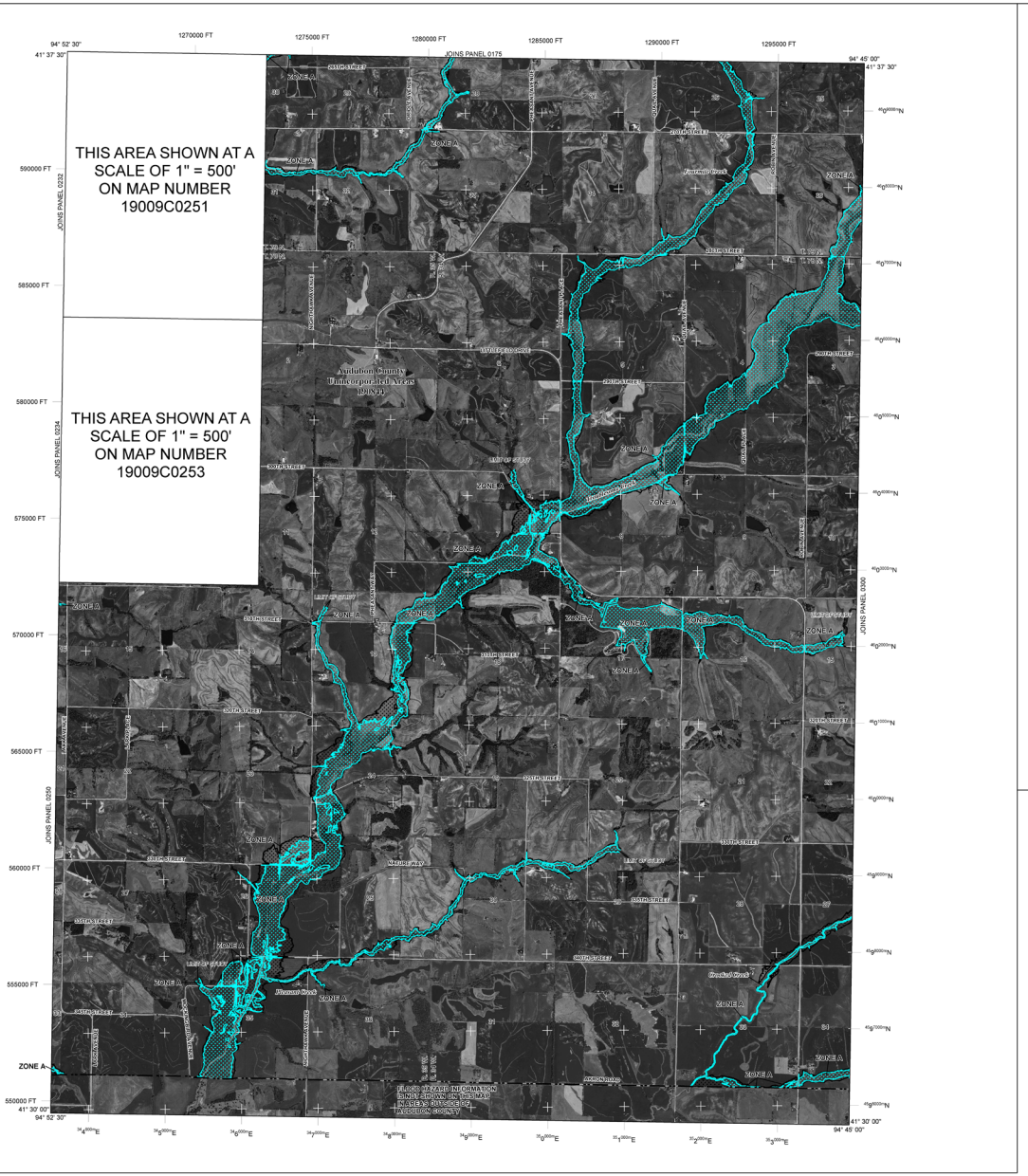
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

4648000 N — 1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP

PANEL 0275D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 275 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0275	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0275D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

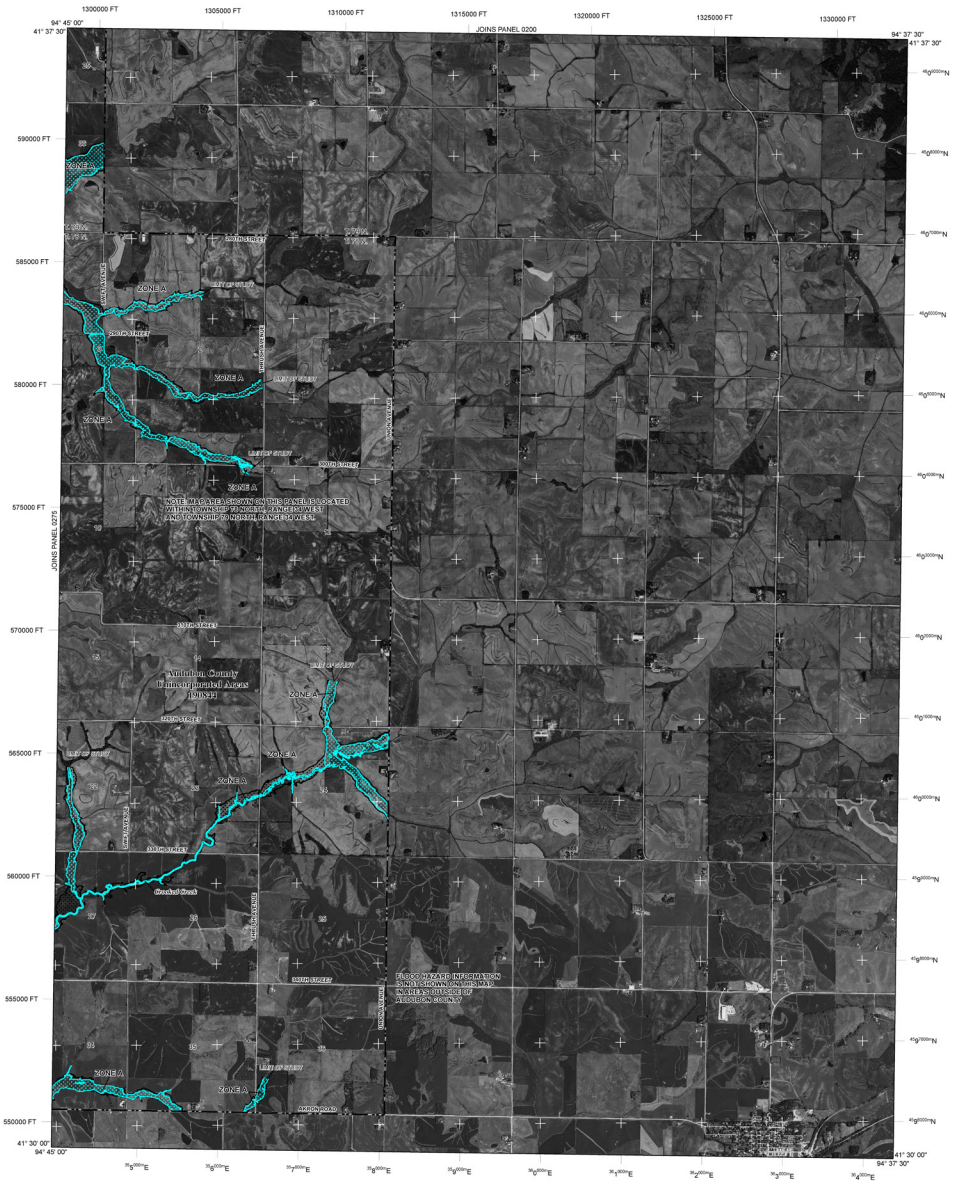
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 93° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0300D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 300 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

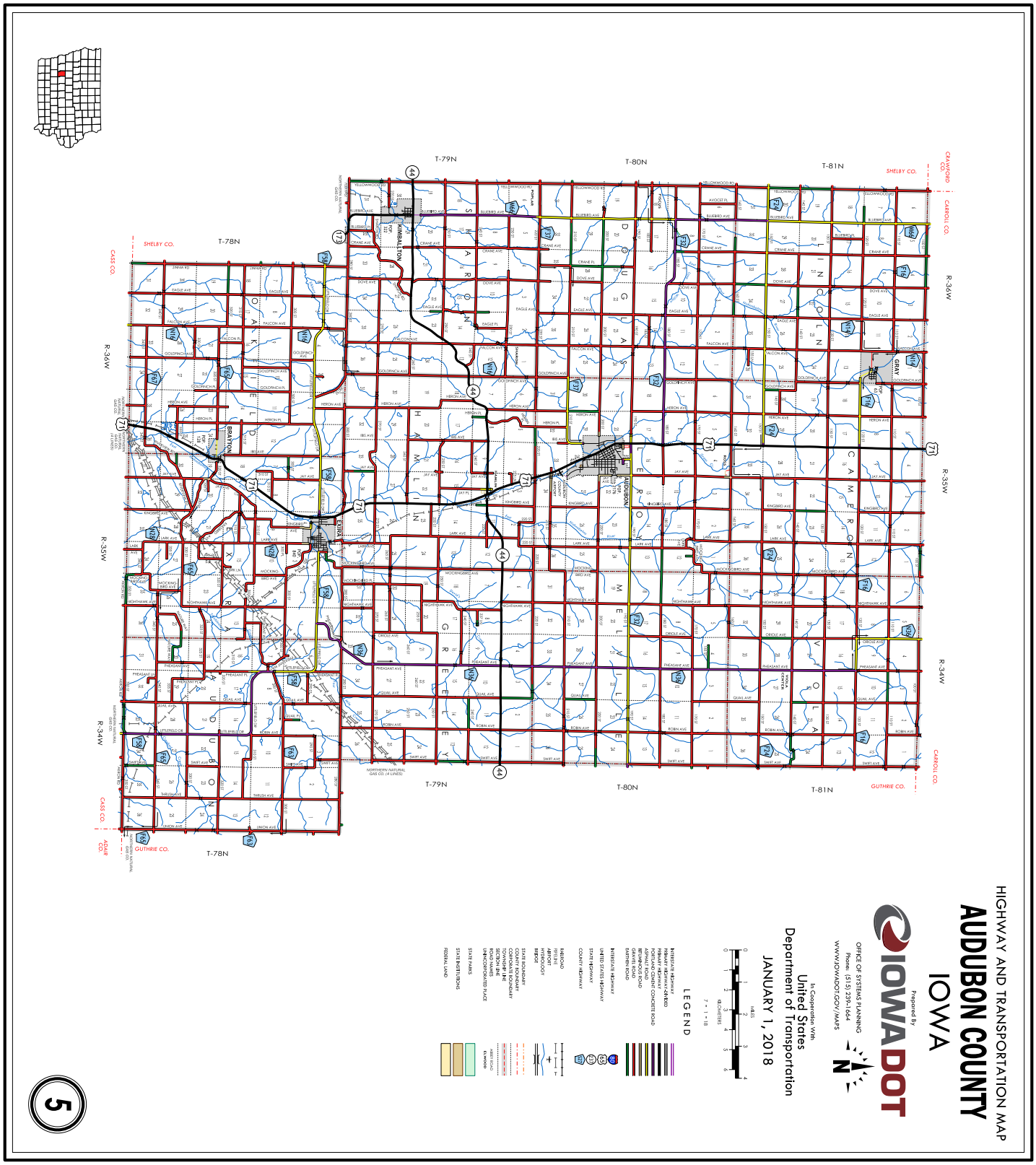
COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0300	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0300D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

Additional Critical Facility Maps



Resolution 2024-50

Resolution Adopting Multi-Jurisdictional Hazard Mitigation Plan

A RESOLUTION OF THE AUDUBON COUNTY SUPERVISORS ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the Audubon County Supervisors participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the Audubon County Board of Supervisors adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 3RD DAY OF DECEMBER, 2024.

Chairperson, Board of Supervisors

ATTEST:

Audubon County Auditor

Appendix B: City of Audubon

Community Profile

History

Audubon was laid out by the Chicago, Rock Island, and Pacific Railroad on September 23, 1878. By December of that year, over 50 houses, a bank, five general stores, two hotels, and multiple other businesses were already constructed within the new town. The following year, the Audubon County Courthouse moved from Exira to Audubon. Growth of the city continued at a fairly rapid pace until 1900, and then continued more moderately until 1950. In addition to the Rock Island Railroad, the Chicago & Northwestern built a line north out of the community, connecting to Manning in the 1990s.

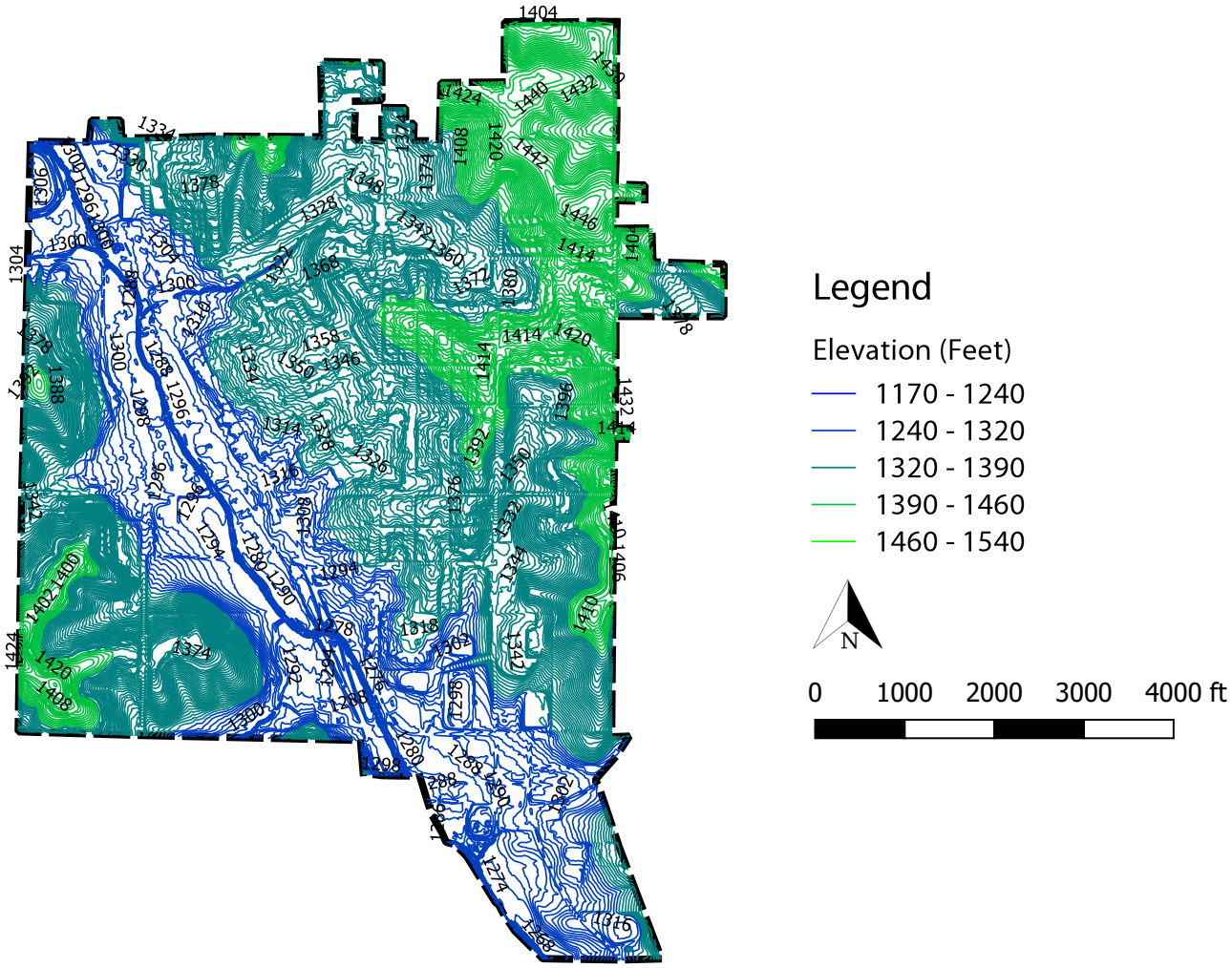
The railroad played an important part in the vitality of the local economy for many years. Audubon County was long known for its strong cattle industry, and "Operation T-Bone" was a standing tradition of shipping trainloads of cattle to market in Omaha and Chicago. Today, the community continues to celebrate this tradition with "T-Bone Days" held every summer, even though cattle shipping is a thing of the past as the railroad leading to Audubon is long since abandoned.

The City of Audubon, like Audubon County, is named after John James Audubon, a naturalist and artiStreet "Albert the Bull," a 30 ft. tall, 45-ton bull, is one of the community's most popular attractions and is located on the south side of town along Highway 71.

Geography and Environment

The City of Audubon is located in central Audubon County in West Central Iowa. The main transportation route through the city is U.S. Highway 71, which runs north and south through the community. Audubon's 1.9 square miles of land is gently rolling, and is generally favorable for development, with no major hills or valleys. There are no major rivers or other bodies of water that run through or near the City of Audubon.

Map B.1: City of Audubon Elevation



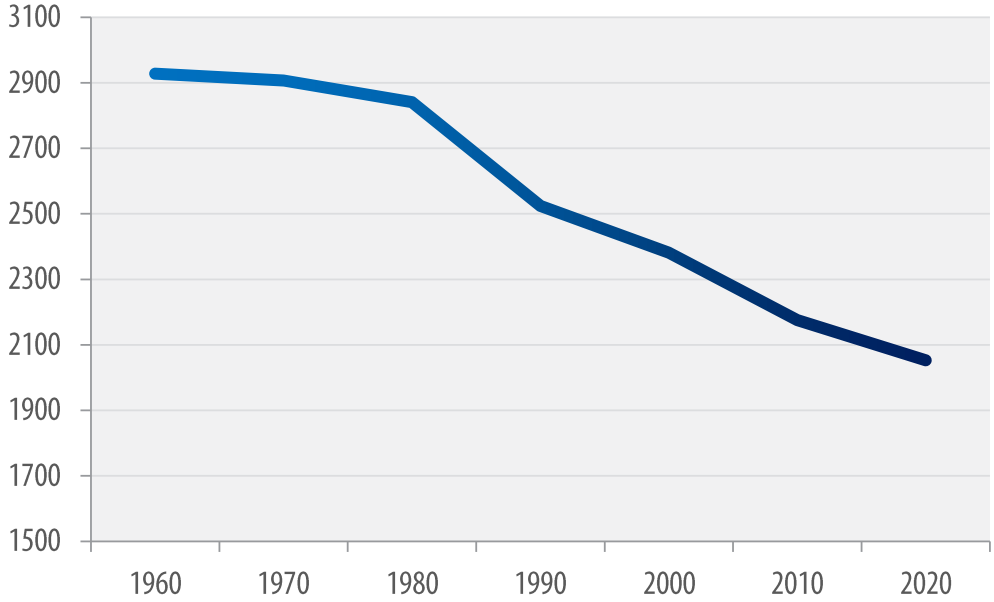
Demographics

The population of an area represents one of its most important assets. A population includes the labor force, entrepreneurs, taxpayers, and buyers of goods and services. This section will address several characteristics of Audubon's population through past, present, and future trends of the region.

The size and composition of a community's population can exert influence on its development. For instance, population size, composition, and distribution influence the range of businesses a community can support, the pool of workers from which to draw, and the demand for and supply of services. Similarly, the effect people have on the social, economic, and physical environments depends upon the composition, expectations, and distribution of the population. A population's age distribution, income levels, ancestry, and educational attainment are some of the characteristics that mold a community. Population trends give community leaders and elected officials information on what kind of services need to be provided and offers prospective employers an overview of the local labor force.

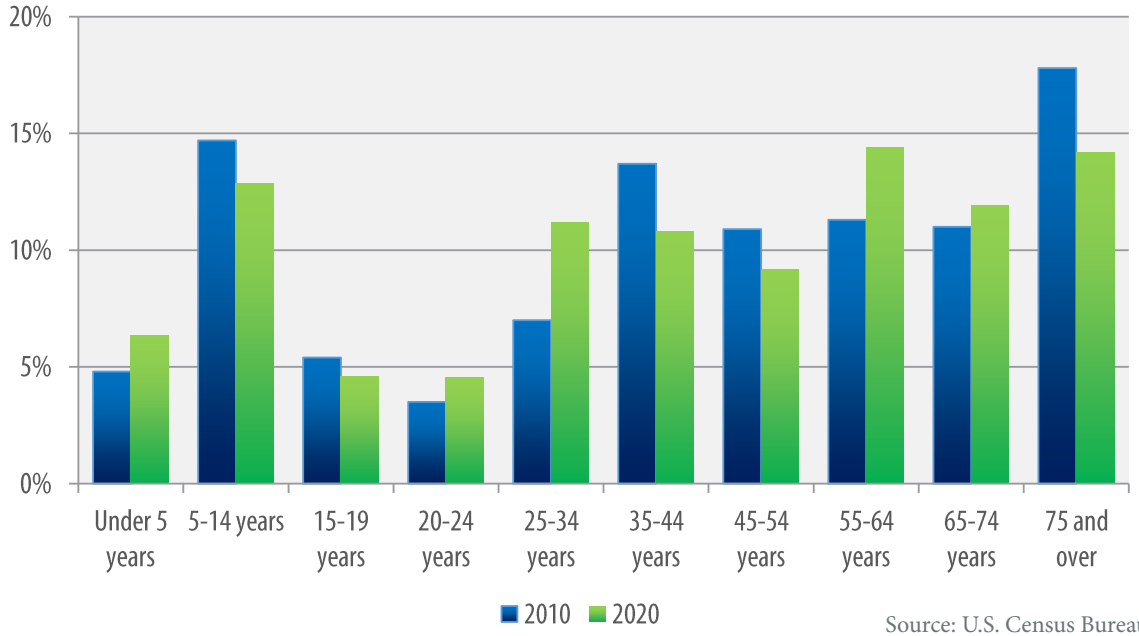
Over the past 50 years, the City of Audubon has experienced a gradual decline. In 1960, Audubon had a population of 2,928. Since then, the City's population has declined 30% (875 residents) to 2,053 in 2020. The most dramatic change happened between 1980 and 1990 when the city lost 317 residents.

Figure B.1: City of Audubon Historic Population, 1960-2020



Source: American Community Survey

Figure B.2: City of Audubon Age Distribution, 2010 & 2020



Source: U.S. Census Bureau

The City's population makeup is not very different from other parts of Audubon County, and even most of the State of Iowa. Population cohorts at age 50 and above have generally higher numbers than other younger cohorts. This information can be found in figure B.2.

Housing

A community's ability to attract new residents is important. One of the most important aspects to attracting residents is housing. A community's housing stock, type of households, and housing availability and affordability are determining factors.

Since 2010, the city's housing stock has increased by 79 units, all of which were renter-occupied additions. During this time, the City saw a 49% decrease in vacant properties. Table B.1 shows a breakdown of the city's occupied and vacant housing units.

Table B.1: City of Audubon Housing Units, 2010 & 2022

	2010		2022	
	Number	Percent	Number	Percent
Occupied Housing Units	961	86.89%	1,040	93.4%
Owner Occupied	773	80.44%	773	74.3%
Renter Occupied	188	19.56%	267	25.7%
Vacant Housing Units	145	13.11%	74	6.6%
Total Housing Units	1,106	100.00%	1,114	100.00%

Source: American Community Survey

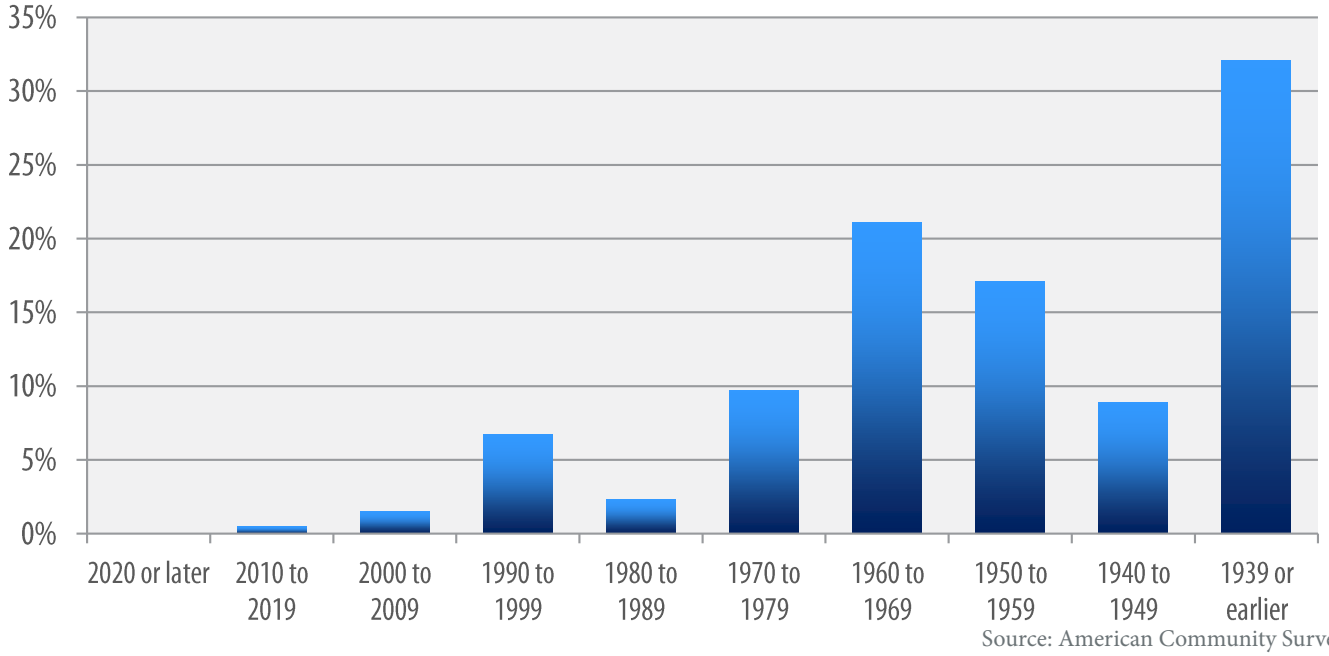
Table B.2: City of Audubon Value of Owner-Occupied Units, 2022

Value of Housing Unit	Percent of Homes
Less than $50,000	18.2%
$50,000 to $99,999	38.5%
$100,000 to $149,999	28.5%
$150,000 to $199,999	10.9%
$200,000 to $299,999	3.9%
$300,000 to $499,999	0.0%
$500,000 to $999,999	0.0%
$1,000,000 or more	0.0%

Source: American Community Survey

Audubon, like many other small rural towns in Iowa, has a lower median housing value of $87,400. The State of Iowa has a median housing value of $162,200. The city's homes can be very affordable and can be used to attract new residents, but they may deteriorate faster and will need a number of repairs and updates. According to the 2022 American Community Survey Estimates, 18.2% of the city's homes are valued less than $50,000. A complete breakdown of the value of homes in Audubon can be found in Table B.2. Knowing information about the city's housing stock is useful after a disaster hits to determine how much damage was done, and how it will affect the city moving forward.

Figure B.3: City of Audubon Year Housing Units Constructed, 2022



Source: American Community Survey

Figure B.3 showcases the year housing units within the City of Audubon were constructed. Like most of the county, Audubon has a large portion (32.1%) of the homes constructed in 1939 or earlier. The city also experienced spikes in construction during 1940-1979. The 1940s saw 8.9% of the city's homes being built. During the 1950s, 17.1% of the city's housing stock was constructed, and 9.7% were built during the 1970s. The 1960s was the second largest housing construction period, with 21.1% of the homes being built. Building standards of today utilize the most recent construction materials and safety features, ensuring that the new residential strictures are as safe as possible. This does not mean that older homes are more unsafe, just that they may be more susceptible to hazard damage.

Economics

Household income is an important indicator of the economic base in Audubon County. In Audubon, the median household income is $42,438 which would classify a large number of the households in Audubon as "working" or "middle" class. The City of Audubon's household income breakdown is similar to the other rural communities in the area, and the combination of more affordable housing with the current incomes generally provides residents with a decent quality of life. Educational services, and health care, and social assistance is the largest industry within the City, which is consistent with the County as a whole. While Audubon is the county seat and home to several employers, many employees commute to other larger neighboring cities like Atlantic, Carroll, and Harlan where more employment opportunities are present.

Table B.3: City of Audubon Household Income, 2022

Income and Benefits (2022Inflation-Adjusted Dollars)	Number of Households	Percent of Households
Less than $10,000	50	4.8%
$10,000 to $14,999	20	1.9%
$15,000 to $24,999	138	13.3%
$25,000 to $34,999	168	16.2%
$35,000 to $49,999	215	20.7%
$50,000 to $74,999	121	11.6%
$75,000 to $99,999	108	10.4%
$100,000 to $149,999	114	11.0%
$150,000 to $199,999	77	7.4%
$200,000 or more	29	2.8%
Median Household Income	$42,438	-
Mean Household Income	$65,677	-

Source: American Community Survey

Audubon, overall, is a small community in a small rural county. A large percentage of the businesses within the county serve the largely agricultural economy. Some of the largest businesses within the city include the and AMVC, which employs over 200 people in the management of production hog farming. Table B.4 breaks down what industry Audubon residents work in. Education, healthcare, and social assistance employs the largest cohort of residents, with 30.2% employed in this industry. This industry is represented by the Audubon Community School and Audubon County Memorial Hospital employing large numbers of workers. The second largest is retail trade, with 16.0% of the residents employed in this industry, followed by agriculture, forestry, fishing and hunting, and mining, with 12.3% employed.

Table B.4: City of Audubon Employment by Industry, 2022

Industry	Number	Percent
Total civilian non-farm employment, 16 years and over	1,025	100%
Agriculture, Forestry, Fishing, Hunting, Mining	126	12.3%
Construction	83	8.1%
Manufacturing	51	5.0%
Wholesale Trade	36	3.5%
Retail Trade	164	16.0%
Transportation and warehousing and utilities	32	3.1%
Information	7	0.7%
Finance and insurance, and real estate and rental and leasing	56	5.5%
Professional, scientific, management, administrative, and waste management services	28	2.7%
Educational, health care, and social assistance	310	30.2%
Arts, entertainment, recreation, accommodation, and food services	70	6.8%
Other services, except public administration	31	3.0%
Public Administration	31	3.0%

Source: American Community Survey

Existing Documents & Capabilities

The current planning and regulatory documents along with the year they were last updated for the City of Audubon can be found in Table B.5. These documents help prepare the city in times of hazards. First and foremost, the previous hazard mitigation plan, as well as this document lays out specific strategies to help the city reduce the impact hazards have on the community and those who live in it. The City of Audubon implements floodplain regulations which restrict what can and cannot be constructed within the floodplains. These also regulate how things are to be constructed if they are built in the floodplain. This is to reduce the amount of impact any flooding has on the community. The City's zoning ordinance was developed to keep certain districts separated from others. This is important when constructing new industrial uses as they can pose health threats to residents, and the zoning can help eliminate some risks of human disease and in cases of industrial fires, can reduce the spread of the fires throughout the city. State building codes have been adopted to ensure new construction meets the building codes approved by the State of Iowa. This reduces the risk for structural fires, infrastructure failure, human disease, HAZMAT incidents, and can reduce impacts of potential flooding. These plans and codes work together to ensure that the development of the community is cohesive and looks out for the health and safety of residents as well as reducing potential hazard impacts.

The City of Audubon's road infrastructure is currently undergoing some upgrades, but continued upgrades will be necessary. The city is in the same situation with their water and sewer infrastructure, especially if the city were to expand. The city's current infrastructure and future needs are being evaluated through help from the local COG in developing the city's comprehensive plan which can be expanded to include more disaster response steps based on the type of disaster or damage that occurs. The city can improve the infrastructure though constant projects/planning which reduces the need for large undertakings at once. Also, the city can partner with other utility companies present in the city to create cohesive project plans to reduce disruption and construction at different times within similar portions of town. In some instances, utility/equipment sharing between jurisdictions is possible, especially in terms of sewer jets and street sweepers. Also the creation continuation of operation plans would be beneficial in response to hazards and would help mitigate further damage after an event.

Table B.5: City of Audubon Existing Documents

Document	Yes/No	Year
Previous HMP	Yes	2019
Comprehensive Plan	Yes	In Progress
Building Code	State	-
Zoning Ordinance	Yes	2004
Strategic Plan	Yes	1997
Housing Needs Assessment	Yes	2019
NFIP Participant	Yes	1987
Floodplain Regulations	Yes	2016

NFIP Participation

In the past, there have been instances of flooding within the city limits of Audubon. Audubon started participating in the NFIP in 1987, and the flood map was updated in 2016. The Zoning Administrator for the City of Audubon acts as the city's floodplain administrator. Any development/demolition in the floodplain is required to obtain a permit which regulates the development/demolition and lays out the NFIP regulations that must be followed. Audubon participates in the NFIP and implements substantial improvement / substantial damage provisions in the following manner: Local officials (1) determine the cost of work, (2) determine the market value of buildings, (3) make SI/SD determinations and provide determinations to property owners, and (4) require owners to obtain permits to bring substantially improved and substantially damaged structures into compliance with the floodplain management requirements. The city's FIRMs can be found in the later in this appendix.

Outlook and Future Development

Since the last plan update, there have been some changes within the city. The city has started redevelopment downtown, there has been new development on the south side of the city along Highway 71, and housing continues to be developed and upgraded. Throughout this planning period, it is anticipated for similar development patterns to continue. Housing infill is expected to continue and additional development along Highway 71 is expected. While the city is likely to experience some new development over the planning period, the jurisdiction's vulnerability will remain the same. The city will be strategic about development to ensure that it does not make itself more susceptible to hazards.

Critical Facilities

Critical facilities are facilities that are critical to the health and welfare of the population and are especially important following hazard events. Every jurisdiction is unique in such way that the list of critical facilities can vary widely from community to community. Audubon's critical facilities can be found on map B.2.

Essential Infrastructure and Services

Knowing what services and infrastructure serves the city can be beneficial in a time of disaster so the appropriate companies can be contacted in need of utility shutoff or updated transportation routes. The city's essential infrastructure and services can be found in table B.6.

Table B.6: City of Audubon Essential Infrastructure and Services

Major Arterials	U.S. Highway 71	**Air Service**	Audubon County Airport
Water Service	Municipal	**Sewer Service**	Municipal
Electric Service	MidAmerican Energy	**Gas Service**	MidAmerican Energy
Sanitation/Solid Waste	Carroll Refuse	**Landfill**	Audubon County Sanitary Landfill/Transfer Station
Phone and Internet	Mediacom, Windstream, Wireless	**Law Enforcement**	Audubon Police Department
Fire Service	Audubon Fire Department	**Ambulance Service**	Audubon Fire & Rescue

Audubon Community School District

All of the district's buildings are located within the City of Audubon. The Audubon Elementary School is located at 600 Tracy Street and the District Office and Middle/High School are located at 800 Third Avenue. As stated on the district's website "Our MISSION is to provide a quality education in a positive, equitable, and respectful environment that encourages and prepares all students to become lifelong learners and responsible members of a rapidly changing society." Students in grades Pre-K through Grade 4 attend the Audubon Elementary School and grades 5-12 attend the Audubon Middle School and High School.

Students and staff participate in drills and educational programs related to hazards and the mitigation of them. The District maintains its own equipment and supplies to maintain roads and walkways on campus.

Table B.7: Audubon Community School District Enrollment

School Year	Facility	Enrollment	Facility	Enrollment	Total Enrollment
2018-19	Middle/High School	296	Elementary	248	544
2019-20	Middle/High School	308	Elementary	244	552
2020-21	Middle/High School	293	Elementary	240	533
2021-22	Middle/High School	301	Elementary	246	547
2022-23	Middle/High School	296	Elementary	251	547

Table B.8: City of Audubon Critical Facilities

Number on Map	Name	Address	Type
1	Airport	2110 US-71	Essential Facility
2	Audubon Assembly of God Church	514 Pacific Avenue	Vulnerable Population
3	Audubon Church of Christ	2050 US-71	Vulnerable Population
4	Audubon County Courthouse	318 Leroy Street	Essential Facility
5	Audubon County Memorial Hospital	515 S Pacific Avenue	Vulnerable Population
6	Audubon Elementary School	600 Tracy Street	Vulnerable Population
7	Audubon High School	800 3rd Avenue	Vulnerable Population
8	Casey's	400 Market Street	HAZMAT
9	Agriland FS Fuel Stop	214 N Market Street	HAZMAT
10	City Hall	315 Broadway Street	Essential Facility
11	Faith Community Church	226 Chicago Street	Vulnerable Population
12	Fire Station	113 Market Street	Essential Facility
13	First Presbyterian Church	301 Church Street	Vulnerable Population
14	First United Methodist Church	428 Washington Street	Vulnerable Population
15	Friendship Home	714 N Division Street	Vulnerable Population
16	Library	401 N Park Place	Public
17	National Guard Armory	601 Southside Avenue	Essential Facility
18	Our Saviour's Lutheran Church	326 Leroy Street	Vulnerable Population
19	Police Station	315 Broadway Street	Essential Facility
20	St. John's Lutheran Church	815 E Division Street	Vulnerable Population
21	St. Patrick's Catholic Church	116 E Division Street	Vulnerable Population
22	St. Patrick's Parish Center	102 Market Street	Vulnerable Population
23	Storm Siren	East Division & South Street	Essential Facility
24	Storm Siren	Davenport Street & Church Street	Essential Facility
25	Storm Siren	Stadium Drive near the Swimming Pool	Essential Facility

Map B.2: City of Audubon Critical Facilities

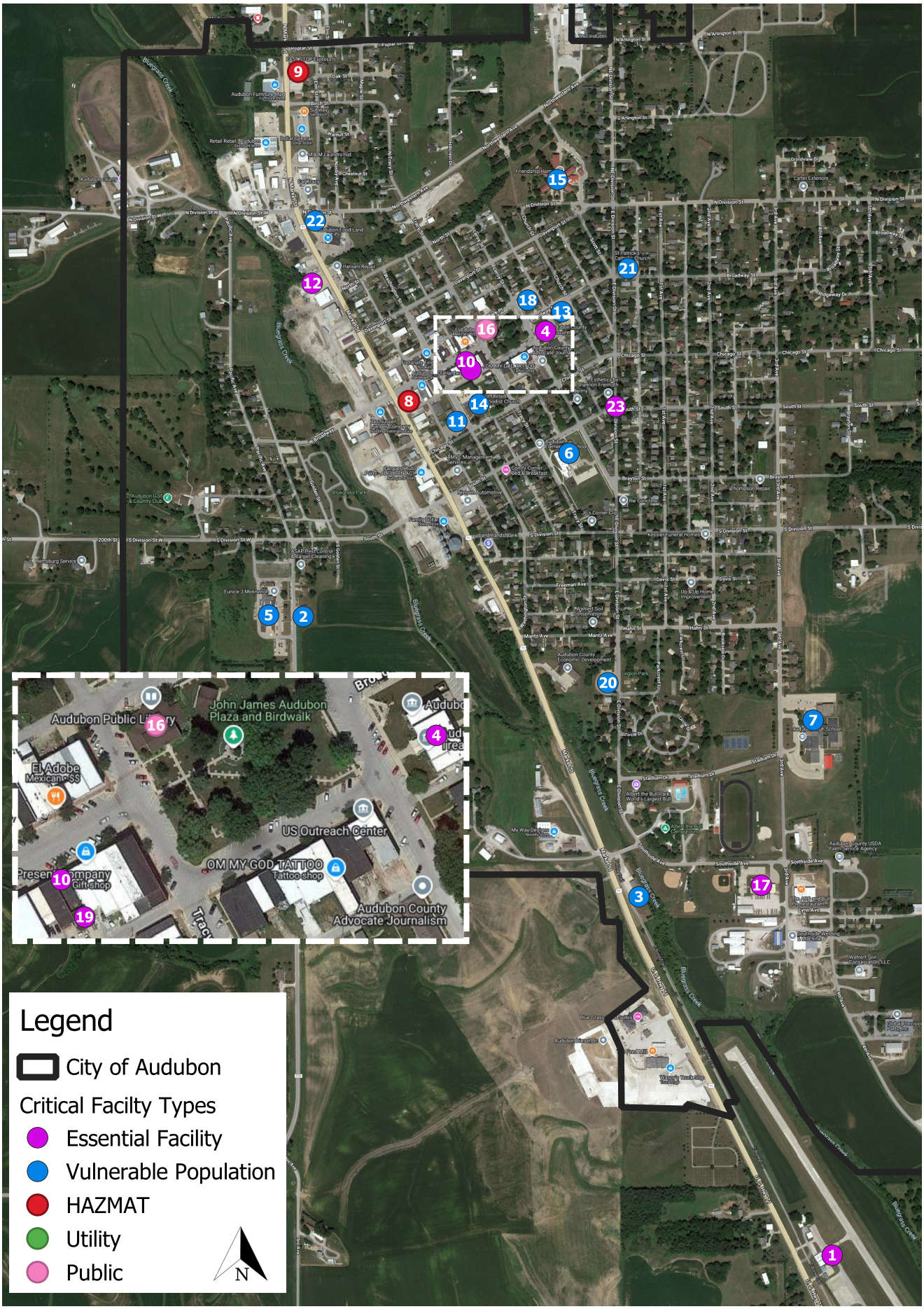


Table B.9: City of Audubon Risk Assessment

Hazard	Comments
Animal/Plant/Crop Disease	The City of Audubon contains a large amount of agricultural land. Although this land represents a large portion of the community, there have been minimal reported losses from animal/plant/crop disease within in the community. While this does impact the community, it is normally indirectly impacted.
Drought	Drought occurrences have increased across the state, and Audubon has not been exempt from this hazard. Droughts continue to increase in severity and while there is little warning, this hazard can cause both direct and indirect issues for the City and it's residents.
Earthquake	There have been no instances of earthquake in the City of Audubon, and the committee feels there will be no instances during the life of this plan.
Expansive Soils	There have been no instances of expansive soils in the City of Audubon, and the committee feels there will be no instances during the life of this plan.
Extreme Heat	Extreme heat events continue to impact Audubon as they do the entire county. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body.
Flash Flood	Since 2018, there have been no instances of flash flooding in the City of Audubon. While flash floods have little to no warning time, with no instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the community for response to an event.
Grass/Wild Land Fire	Grass and wild land fires are most commonly field fires or controlled burns that get out of hand ion and immediately surrounding the city. This hazard can pose a large threat to the community as elements out of anyone's control, such as wind direction and speed, can change this hazard from harmless and controlled to out of control in a matter of minutes and can pose a threat to life.
HAZMAT Incident	Within the most recent planning period, there were two instances of HAZMAT spills within Audubon. Both spills threatened the soil. With two instances in five years, the committee feels this hazard poses a threat to the community and mitigation actions should be strongly considered and implemented to prevent any further instances.
Human Disease	Iowa and more specifically the City of Audubon are still feeling the effects of the COVID-19 pandemic. The pandemic has reignited the need to plan for future outbreaks and examine the city's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.

Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the community to protect lives and property. The most likely infrastructure failure within Audubon would be structural failure of either bridges or roadways. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.
Levee/Dam Failure	There are no levees or dams located in the City of Audubon, but the City owns a dam outside of city limits. It is unlikely that levee or dam failure will impact the city, although the city feels that planning for river flooding and planning for dam/levee failure are similar in nature.
Radiological	During the previous planning period, there were no instances of Radiological Incident in Audubon and the committee does not anticipate any happening in the next planning period. If an incident were to occur, the committee feels it would be a small, contained situation that would not threaten the community as a whole.
River Flooding	Portions of the City of Audubon are located within a flood zone. Since 2018, there have been no reported instances of river flooding in Audubon. This hazard has a medium probability of effecting the community, and has historically caused reportable damage within the community. Primary mitigation actions for this hazard would include limitations on construction in the flood zone.
Severe Winter Storm	Severe Winter Storms continue to impact the City of Audubon. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within the city. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the community.
Terrorism	There have been no instances of terrorism in the City of Audubon during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the community. While they are frequent, most storms pose no threat to life, crops, or property. This hazard is prevalent in Audubon but is normally not severe in nature.
Tornado	Audubon County has experienced a number of tornadoes in the recent past, but the City of Audubon has not been impacted directly. While the city has not experienced any tornadoes within the past planning period, it is important for the city to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. Preparing the public and community is vital to ensuring there is no loss of life.
Transportation Incident	Speed limits within the majority of the City of Audubon are relatively low, but portions of the community have higher speed limits. With the majority of the community having lower speed limits, it is likely that any transportation incident between vehicles is likely to cause little damage to property or humans, but there is a chance of an incident which can cause extensive damage. The committee anticipates that this hazard will effect the community in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused reported damage to properties. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Audubon prompting the community to prepare more effectively for these hazards.

Table B.10: City of Audubon Maximum Building and Population Exposure

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	5	$617,760	2,043
Commercial	147	$11,491,944	
Industrial	6	$1,881,190	
Residential	996	$64,538,653	

It is unlikely that a jurisdiction can determine the impact any hazard will have. If a hazard were to impact the entire city, the numbers in table B.10 shows the number of people who would be affected and the maximum number of structures and their value. If this type of event were to occur, a shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability or even death.

The following hazards were determine to have a negligible impact on the city, if they were to occur.

Dam/Levee Failure	Landslide
Earthquakes	River Flooding
Expansive Soils	Radiological

If a hazard were to report negligible impacts, it is anticipated that the numbers impacted would be similar to table B.11. If there were any shutdown of facilities or services, it is likely that these shutdowns would be for less than twenty-four hours. If any injuries were to occur, it is anticipated that these would be able to be treated with first aid. A negligible hazard would impact approximately 9% of the city.

Table B.11: City of Audubon Negligible Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	0	$0	183
Commercial	13	$1,034,274	
Industrial	0	$0	
Residential	90	$5,808,478	

The following hazards were determine to have a limited impact on the city, if they were to occur.

Thunderstorm/Lightning/Hail	Tornado
Windstorm	Grass/Wild Land Fire
Severe Winter Storms	Infrastructure Failure
Extreme Heat	HAZMAT Incident
Flash Flood	Transportation Incident

If a hazard were to report limited impacts, it is anticipated that the numbers impacted would be similar to table B.12. A shutdown of some facilities and services could last more than a week and any injuries/illnesses would not result in permanent disability. It is estimated that 25% of the city would be impacted.

Table B.12: City of Audubon Limited Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	1	$154,440	511
Commercial	37	$2,872,986	
Industrial	2	$470,298	
Residential	249	$16,134,663	

The following hazards were determine to have a limited impact on the city, if they were to occur.

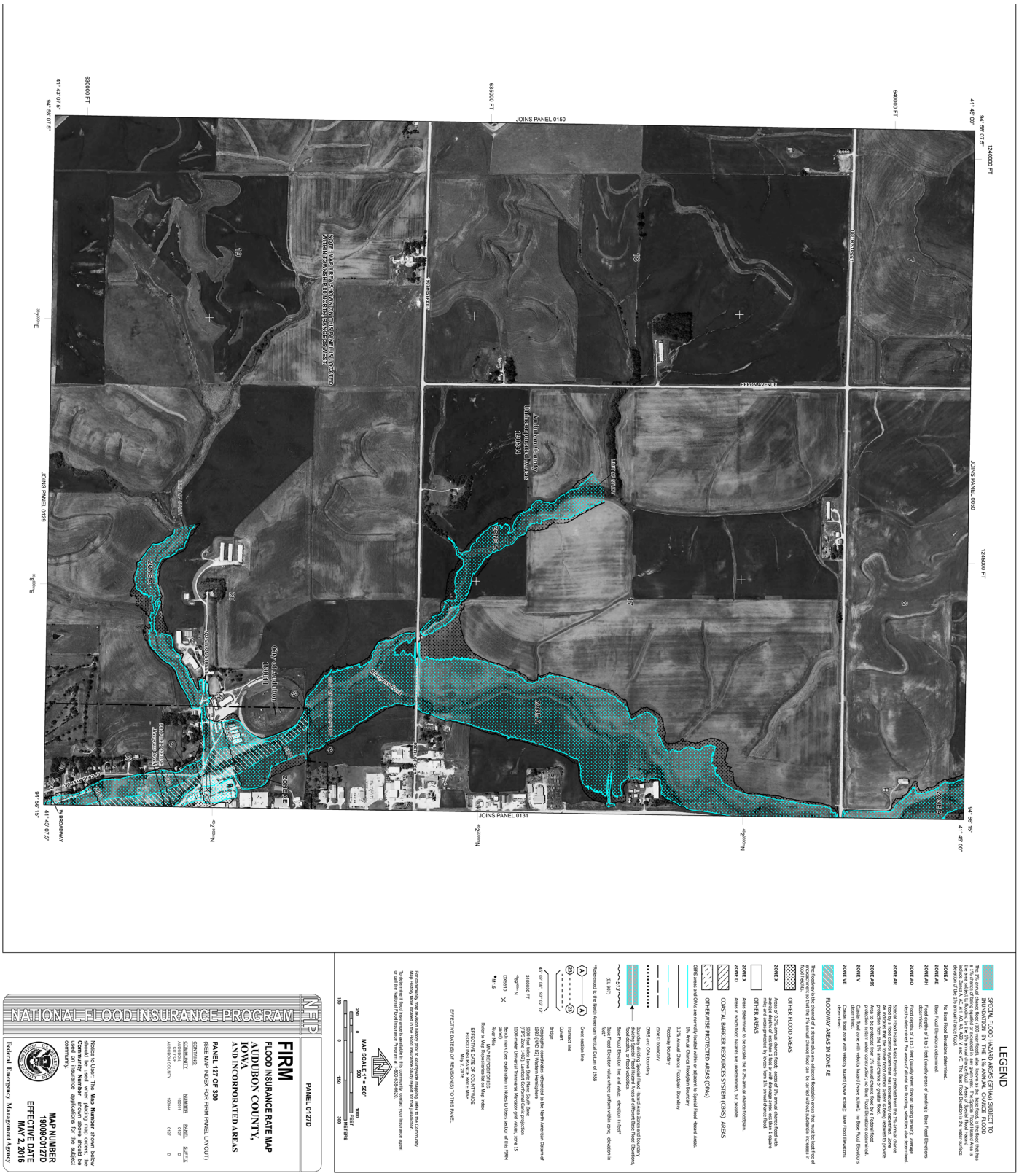
Drought
Animal/Plant/Crop Disease
Human Disease

If a hazard were to report critical impacts, it is anticipated that the numbers impacted would be similar to table B.13. A shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability. It is estimated 50% of the city would be impacted.

Table B.13: City of Audubon Critical Hazard Impact

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	3	$308,880	1,022
Commercial	74	$5,745,972	
Industrial	3	$940,595	
Residential	498	$32,269,327	

Flood Maps



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Special Flood Hazard Areas include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Zone D Boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

Base Flood Elevation line and value; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

Bridge

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

1000-meter Universal Transverse Mercator grid values, zone 15

3000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

5000-foot grid ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

1000-meter Universal Transverse Mercator grid values, zone 15

Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES

Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

PANEL 0127D

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 127 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	COMMUNITY	NUMBER	PANEL	SUFFIX
	AUDUBON, CITY OF	190011	0127	D
	AUDUBON COUNTY	190944	0127	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0127D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713 - 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

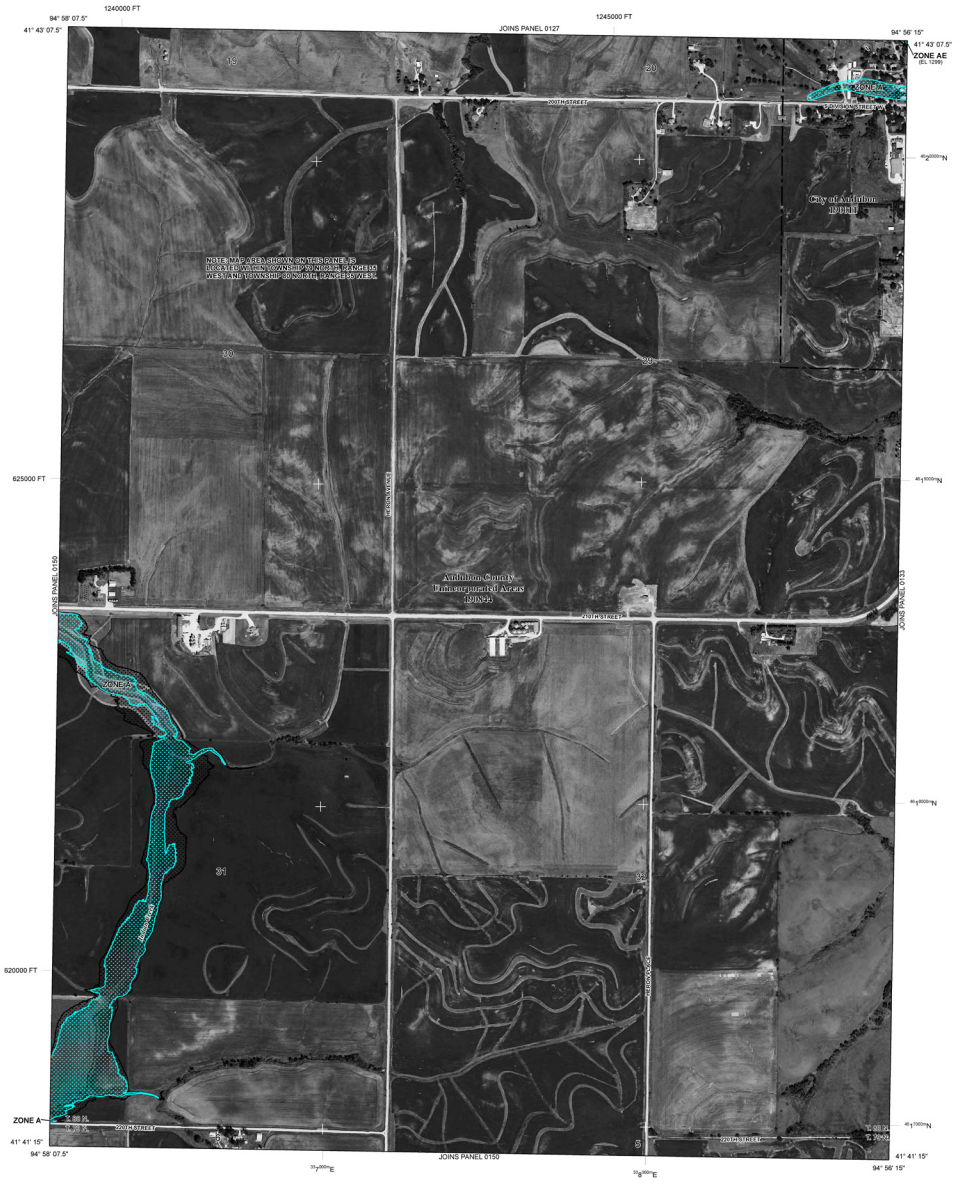
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

23 — 23 — Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

4°66'000" N — 1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0129D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 129 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

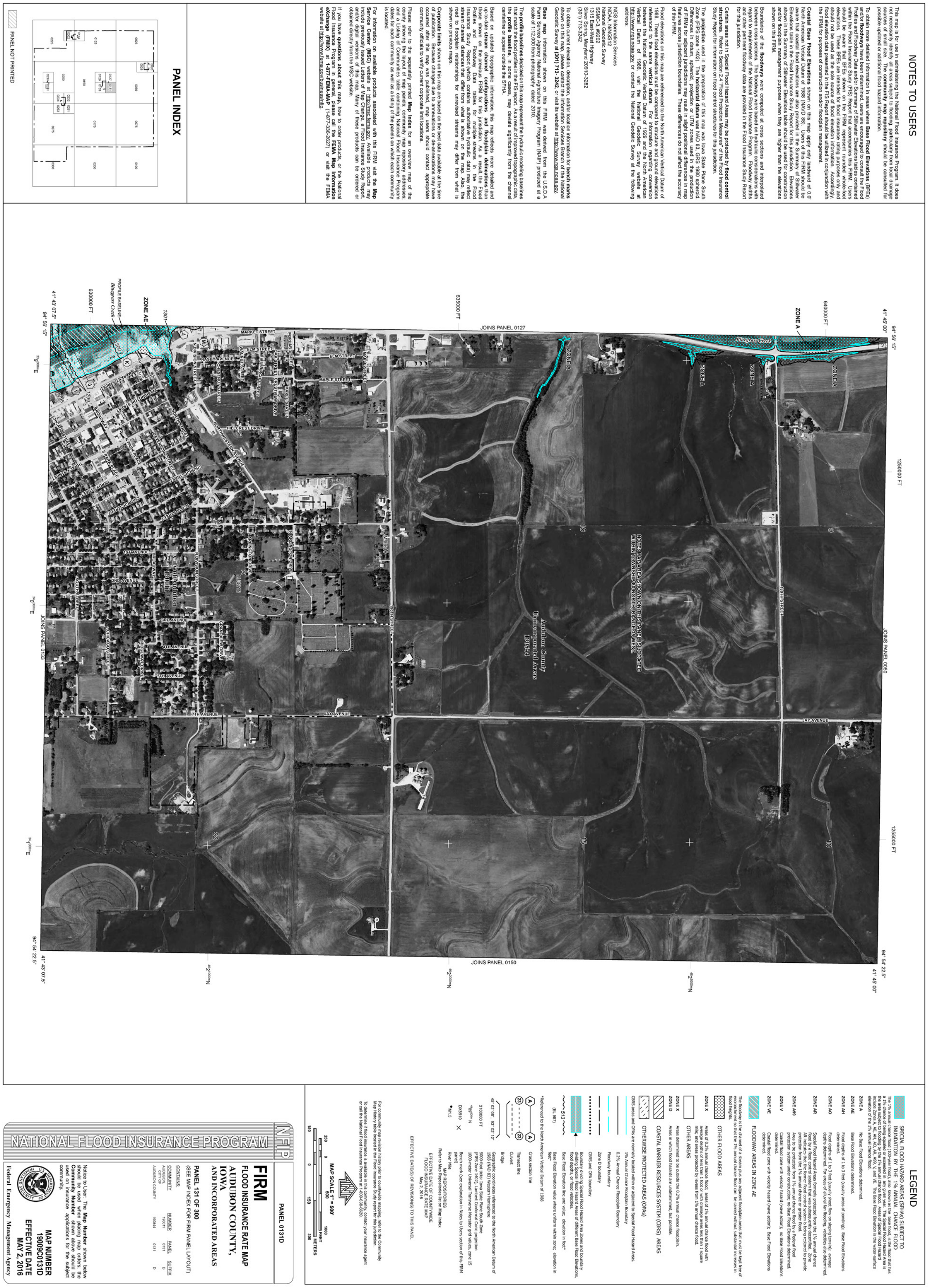
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON, CITY OF	190011	0129	D
AUDUBON COUNTY	190844	0129	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0129D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency


NOTES TO USERS
PANEL INDEX
LEGEND
JOINS PANEL 0127
JOINS PANEL 0150
JOINS PANEL 0133
JOINS PANEL 0050
ZONE A
ZONE AE
NFIP
PANEL 0131D
FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY,
IOWA
AND INCORPORATED AREAS
PANEL 131 OF 300
NATIONAL FLOOD INSURANCE PROGRAM
MAP NUMBER
19009C0131D
EFFECTIVE DATE
MAY 2, 2016
Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

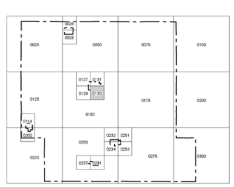
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

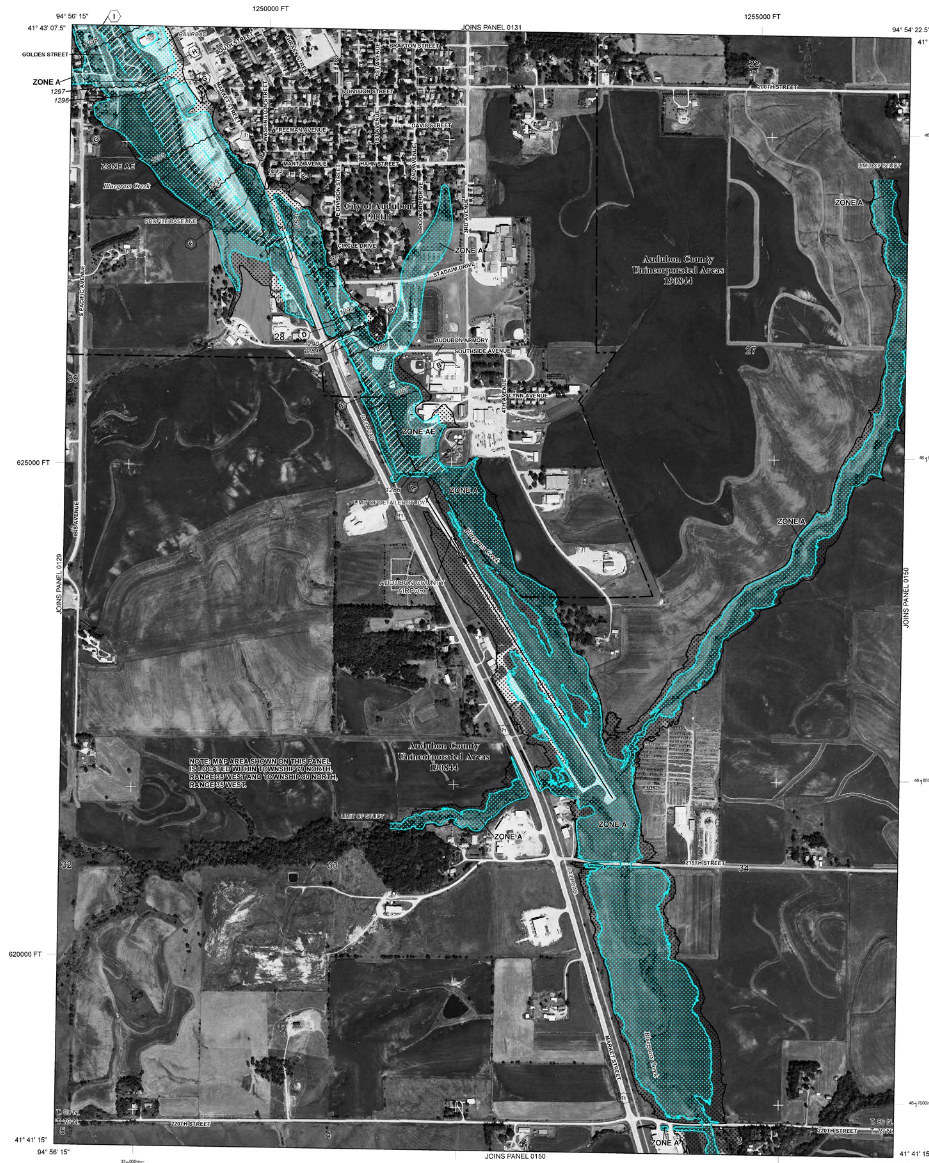
For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX



PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% Annual Chance Floodplain Boundary
	0.2% Annual Chance Floodplain Boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)—(A)	Cross section line
(23)- - -(23)	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT	5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
4989000m N	1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0133D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA
AND INCORPORATED AREAS

PANEL 133 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON, CITY OF	190011	0133	D
AUDUBON COUNTY	190844	0133	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0133D

EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

Table B.14: City of Audubon Status of Previous Mitigation Actions

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Tree trimming program			X		
Sewer lift stations improvement	X				
New sewer and water lines	X				
Back-up all records and store offside, store on the "cloud"			X		
Cooling centers during heat waves			X		
Install GPS in all emergency and fire vehicles	X				
Continue to look for other alternatives for HAZMAT response	X				
Continued practice of drills and safety procedures with children at school			X		
Adopt wellhead protection ordinance		X			
Purchase backup generator for city maintenance shop and fire station			X		
Backup generator at 5-12 school			X		
Build a safe room at both schools			X		
Training on bus evacuation			X		
Continue to train local volunteers as much as feasibly possible			X		
Install GPS in all school busses			X		
Maintain and upgrade warning sirens	X				
Coordinated plans for all entities		X			
Post list of shelters in public areas			X		
Weather radios			X		
Build a safe room at Friendship Home			X		
Bury power lines		X			
Better communications with elderly regarding disasters			X		
More handicapped accessible buildings			X		
Materials to all homeowners and renters concerning hazards			X		
Develop and practice evacuation plans citywide			X		

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Provide local businesses with a list of information for power outages such as contacts for generators, locations of community shelters, or a list of preventative actions to do during a power outage			X		
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance		X			

City of Audubon Action Plan

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table B.15: City of Audubon Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other community assets from the effects of hazards**
Objective 1	Improve early warning signs
Objective 2	Improve public infrastructure
Objective 3	Provide back-up assistance for all critical systems
Goal 2	**Minimize to the greatest possible extent the vulnerability of the people of Audubon County to the impacts of all identified hazards**
Objective 1	Protection of school children
Objective 2	Safety/protection of handicapped and elderly citizens
Goal 3	**Improve coordination, communication, and response operations with other relevant organizations**
Objective 1	Provide education and training
Objective 2	Improve first responder resources and capabilities
Goal 4	**Improve public communication, education, and awareness of hazards and their risks in Audubon County**
Objective 1	Provide education and training

Table B.16: City of Audubon Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Tree trimming program	Tornado, Winter Storm, Thunderstorm/Lightning/Hail, Animal/Plant/Crop Disease	Medium	City, Power Company, Property Owner	Low	City Funds	Prevention	Ongoing
Sewer lift stations improvement	Infrastructure Failure	Medium	City Council	High	City Funds, USDA, SRF, CDBG	Structural Project	Long
New sewer and water lines	Infrastructure Failure	Medium	City Council	High	City Funds, USDA, SRF, CDBG	Structural Project	Ongoing
Back-up all records and store offside, store on the "cloud"	Infrastructure Failure	Low	City Council	Minimal	City Funds	Prevention	Short
Cooling centers during heat waves	Extreme Heat	Low	City Council, Audubon School District	Low	City Funds	Emergency Services	Short
Install GPS in all emergency and fire vehicles	Transportation Incident	Low	Fire Department, Police Department, Emergency Responders	Moderate	City Funds, FEMA AFG, Local Foundations, Donations	Emergency Services	Short
Continue to look for other alternatives for HAZMAT response	HAZMAT Incident	High	Fire Department	Minimal	City Funds	Emergency Services	Ongoing
Continued practice of drills and safety procedures with children at school	Tornado, Infrastructure Failure, Terrorism	High	Audubon School District	Low	City Funds, School Funds	Public Education and Awareness	Ongoing
Adopt wellhead protection ordinance	Drought, Infrastructure Failure	High	City Council	Minimal	City Funds	Prevention	Ongoing
Purchase backup generator for city maintenance shop and fire station	Infrastructure Failure	High	City Council	Low	City Funds, FEMA HMGP, Local Foundations	Emergency Services	Mid

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Backup generator at 5-12 school	Infrastructure Failure	Medium	Audubon School District	Moderate	School Funds, FEMA HMGP, Local Foundations	Emergency Services	Mid
Build a safe room at both schools	Infrastructure Failure, Tornado, Windstorm	High	Audubon School District	High	School Funds, City Funds, FEMA HMGP, Local Foundations	Prevention	Short
Training on bus evacuation	Transportation Incident	High	Audubon School District	Low	School Funds, Training Grants	Emergency Services	Ongoing
Continue to train local volunteers as much as feasibly possible	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council	Minimal	City Funds, FEMA AFG & SAFER	Public Education and Awareness	Ongoing
Install GPS in all school buses	Transportation Incident	Low	Audubon School District	Moderate	School Funds, Iowa Department of Education	Emergency Services	Mid
Maintain and upgrade warning sirens	Tornado	Medium	Fire Department	Moderate	City Funds, USDA Community Facilities, Local Foundations, FEMA HMGP	Emergency Services	Ongoing

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Coordinated plans for all entities	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council, Fire Department, Police Department, School District, Hospital	Minimal	City Funds	Prevention	Short
Post list of shelters in public areas	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Low	Emergency Manager	Minimal	City Funds	Public Education and Awareness	Ongoing
Weather radios	Flash Flood, Tornado, Windstorm, Extreme Heat, Thunderstorm/ Lightning/Hail, River Flooding, Sever Winter Storms	Low	City Council	Minimal	City Funds	Emergency Services	Ongoing
Build a safe room at Friendship Home	Tornado	High	City Council	High	Friendship Home, Local Foundations	Emergency Services	Short
Bury power lines	Tornado, Severe Winter Storm, Thunderstorm/Lightning/Hail	Low	Power Company	High	City Funds, FEMA with State Cost Share	Prevention	Long

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Better communications with elderly regarding disasters	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council	Moderate	City Funds	Public Education and Awareness	Ongoing
More handicapped accessible buildings	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Low	City Council	High	City Funds, ADA Grants, Local Foundations, AARP Grants	Prevention	Long
Materials to all homeowners and renters concerning hazards	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Low	City Council, Fire Department	Minimal	City Funds	Public Education and Awareness	Short

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Develop and practice evacuation plans citywide	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council, Fire Department	Minimal	City Funds	Prevention	Short
Provide local businesses with a list of information for power outages such as contacts for generators, locations of community shelters, or a list of preventative actions to do during a power outage	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Low	City Council, Emergency Manager	Minimal	City Funds	Public Education and Awareness	Long
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance	Flash Flood, River Flood	Medium	City Council, County Emergency Management	Minimal	City Funds	Prevention	Ongoing
Adopt building codes to address various hazards	Hazard Mitigation, Infrastructure Failure, Grass/Wild Land Fire	Low	City Council	Minimal	City Funds	Property Protection	Long

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Construct new fire station	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	Fire Department, City Council	High	City Funds, Fire Department Budget, Local Foundations, USDA, Private Loan	Structural Project	Short-Mid
Update firefighting equipment	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	Fire Department, City Council	Low	City Funds, Fire Department Budget, Local Foundations, Private Grants, FEMA AFG	Emergency Services	Ongoing
Build a storm shelter in the Memorial Building/Create a disaster relief center in the Memorial Building	Earthquake, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council	High	City Funds, FEMA HMGP, Local Foundations, Private Donations	Structural Project	Long
Improve coordination with local hospital to increase the community's resilience to flooding events ("Medical Emergency Coordination Plan")	Flash Flood, Levee/Dam Failure, River Flooding	High	City Council, Fire Department, EMS, Hospital	Minimal	City Funds, Hospital Funds, Planning Grants	Emergency Services	Mid

Table B.17: Audubon Community Schools Risk Assessment

Hazard	Comments
Extreme Heat	Extreme heat events continue to impact Audubon and the Audubon Community School District. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body.
Flash Flood	Since 2018, there have been no instances of flash flooding in the City of Audubon. While flash floods have little to no warning time, with no instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the community for response to an event.
Grass/Wild Land Fire	Grass and wild land fires are most commonly field fires or controlled burns that get out of hand ion and immediately surrounding the city. This hazard can pose a large threat to the school as elements out of anyone's control, such as wind direction and speed, can change this hazard from harmless and controlled to out of control in a matter of minutes and can pose a threat to life.
Human Disease	Iowa and more specifically the City of Audubon are still feeling the effects of the COVID-19 pandemic. The school district continues to have certain precautions and policies in place to better protect students and faculty. The pandemic has reignited the need to plan for future outbreaks and examine the city's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.
Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the community to protect lives and property. The most likely infrastructure failure within the Audubon School District would be structural failure of either bridges or roadways. These failures would impact busing primarily. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.
Severe Winter Storm	Severe Winter Storms continue to impact the City of Audubon and the School District. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within the city. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the community. These instances can require the school to be able to change schedules and bus routing to ensure the safety of the children.
Terrorism	There have been no instances of terrorism in the City of Audubon or the Audubon Community School District during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the community. While they are frequent, most storms pose no threat to life or property. This hazard is prevalent in Audubon but is normally not severe in nature.

Tornado	Audubon County has experienced a number of tornadoes in the recent past, but the City of Audubon has not been impacted directly. While the city has not experienced any tornadoes within the past planning period, it is important for the city to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. Preparing the public and community is vital to ensuring there is no loss of life.
Transportation Incident	Speed limits within the majority of the City of Audubon are relatively low, but portions of the school district have higher speed limits. With a portion of the district having lower speed limits, it is likely that any transportation incident between vehicles is likely to cause little damage to property or humans, but there is a chance of an incident which can cause extensive damage. The committee anticipates that this hazard will effect the district in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused reported damage to properties. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Audubon prompting the community to prepare more effectively for these hazards.

Table B.17: Hazards Not Affecting Audubon Community Schools

Hazard	Reason for Omission
Levee/Dam Failure	School facilities are located well outside the flood zones, so even if a dam were to fail and cause extreme flooding, the schools are in a safe zone. (Source: Iowa Flood Center)
Earthquake	Iowa as a whole has experienced the effects of few earthquakes in the past 175 years. The majority of the earthquakes were along the Mississippi River, therefore the school does not feel this hazard will impact the district.
Expansive Soils	While Iowa has expansive soils, due to the school's locations and history of no issues in the past, the board felt this will not impact the school over the life of this plan.

Audubon Community Schools Action Plan

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table B.18: Audubon Community Schools Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other school assets from the effects of hazards**
Objective 1	Improve early warning signs
Objective 2	Improve infrastructure
Objective 3	Provide back-up assistance for all critical systems
Goal 2	**Minimize to the greatest possible extent the vulnerability of the students and visitors to the Audubon Community Schools to the impacts of all identified hazards**
Objective 1	Protection of school children and staff
Goal 3	**Improve coordination, communication, and response operations with other relevant organizations**
Objective 1	Provide education and training
Objective 2	Improve first responder resources and capabilities
Goal 4	**Improve public communication, education, and awareness of hazards and their risks to the Audubon Community School District**
Objective 1	Provide education and training

Table B.19: Audubon Community Schools Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Backup generator at 5-12 school	Infrastructure Failure, Extreme Heat, Severe Winter Storm, River Flooding, Flash Flood	Medium	Superintendent, School Board, Maintenance Position	Moderate	School Funds, FEMA HMGP, Local Foundations	Emergency Services	Mid
Build a safe room at both schools	Infrastructure Failure, Tornado, Windstorm, Thunderstorm/ Lightning/Hail	High	School Board, Superintendent, School's Engineering Firm	High	School Funds, City Funds, FEMA HMGP, Local Foundations	Prevention	Short
Training on bus evacuation	Transportation Incident	High	Transportation Director, Superintendent, Bus Drivers	Low	School Funds, Training Grants	Emergency Services	Ongoing
Continue to train local volunteers how to respond to the needs of the school and its students during evacuations/ other events	Terrorism, Severe Winter Storm, Thunderstorm/Lightning/Hail, Tornado, Flash Flood, Windstorm, Transportation Incident	High	Transportation Director, Maintenance Position, Local Volunteers	Minimal	School Funds, FEMA AFG & SAFER	Public Education and Awareness	Ongoing
Install GPS in all school buses	Transportation Incident	Low	Transportation Director, Superintendent, School Board	Moderate	School Funds, Iowa Department of Education	Emergency Services	Mid
Continued practice of drills and safety procedures with children at school	Tornado, Infrastructure Failure, Terrorism	High	Superintendent, Transportation Director, School Board	Low	City Funds, School Funds	Public Education and Awareness	Ongoing
Create an emergency operations plan with an infections disease section	Human Disease	High	Audubon School Board, Superintendent, Audubon County Public Health	Minimal	School Funds	Prevention	Short
Prepare and practice district-wide evacuation plans	Grass/Wild Land Fire, Flash Flood, River Flood	High	Audubon School System, City of Audubon	Minimal	School Funds	Public Education and Awareness	Short
Avoid any construction within the floodplain for any new school facilities or amenities	Flash Flood, River Flood	High	Audubon School System	High	School Funds	Prevention	Ongoing

Incorporation into Other Planning Mechanisms

Where possible, Audubon will consider the findings from this document when updating or creating new planning and operating documents. Information from this plan will be utilized to expand and update the following documents:

- Hazard Mitigation Plan
- Comprehensive Plan
- Building Code
- Zoning Ordinance
- Strategic Plan
- Floodplain Regulations
- Housing Needs Assessment

While the city currently does not have any of the plans listed below, if these plans were to be created during the life of this plan, this plan will be used to guide the development of:

- Water Conservation Plans
- Storm Water Management Plans
- Parks and Recreation Plans

Incorporation into Other Planning Mechanisms- Audubon Community Schools

The update of the mitigation strategy will be provided to the School Superintendent for consideration in the next update cycle of the capital improvement plan. Information will be utilized to expand and improve the school's mitigation to potential hazard events.

Resolution No. 2024-43

Resolution Adopting Multi-Jurisdictional Hazard Mitigation Plan

A RESOLUTION OF THE CITY OF AUDUBON ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the City of Audubon participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the City of Audubon adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 9th **DAY OF** December, **2024.**

Hocker aye
Meyer aye
Richardson aye
Grabill absent
Wegner absent

Mayor

ATTEST:

City Clerk

Resolution No. D2401

Resolution Adopting Multi-Jurisdictional Hazard Mitigation Plan

A RESOLUTION OF THE AUDUBON COMMUNITY SCHOOL DISTRICT ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the Audubon Community School District participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the Audubon Community School Board adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 16th **DAY OF** December**, 2024.**

Mark Nissen
Chair

ATTEST:

Secretary

Appendix C: City of Brayton

Community Profile

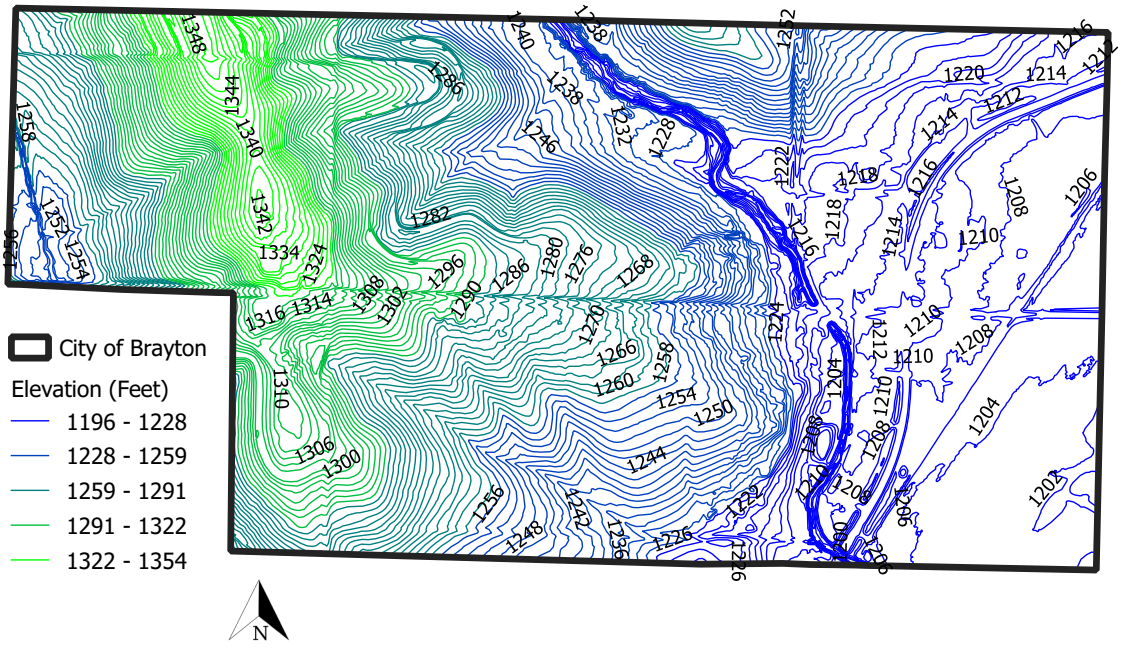
History

In 1878, the City of Brayton was founded in southern Audubon County when the Chicago, Rock Island, and Pacific Railroad was being constructed through the County. The town was named after the first civil engineer employed by the Rock Island Railroad, B.B. Brayton, and was incorporated in 1899.

Geography and Environment

Brayton is located in southern Audubon County in West Central Iowa. The main transportation route through the city is Highway 71 which runs north and south through the eastern side of the city. The City's 0.6 square miles of land is gently rolling, and primarily utilized as farmland. There is a low order creek that runs through the city, but has minimal chance of flooding.

Map C.1: City of Brayton Elevation



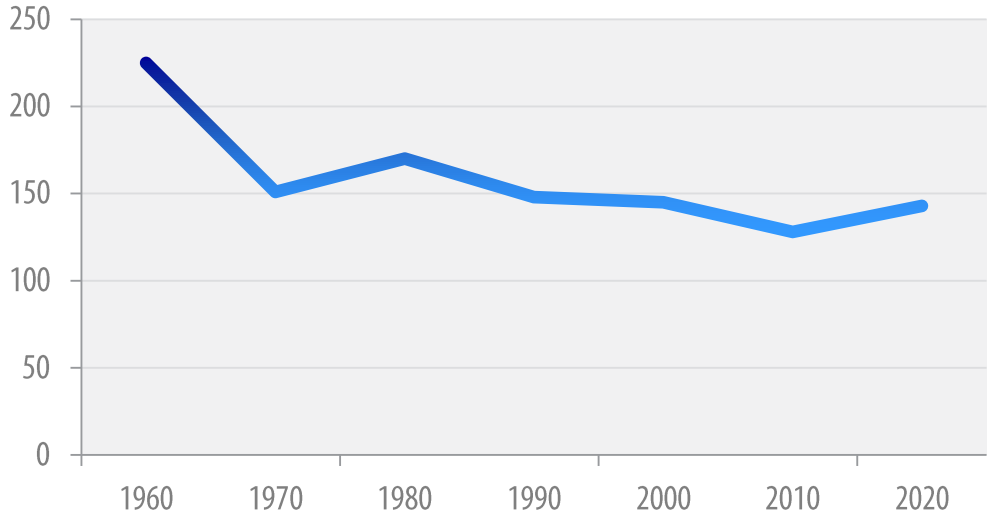
The highest elevation in Audubon County can be found in the northwestern corner of the county. Here, the elevation can reach as much as 1,540 feet above sea-level. Brayton's highest elevation is located in the northwest part of the city where the elevation reaches 1,354 feet. Map C.1 shows Brayton's elevation.

Demographics

The population of an area represents one of its most important assets. A population includes the labor force, entrepreneurs, taxpayers, and buyers of goods and services. This section will address several characteristics of Brayton's population through past, present and future trends of the region.

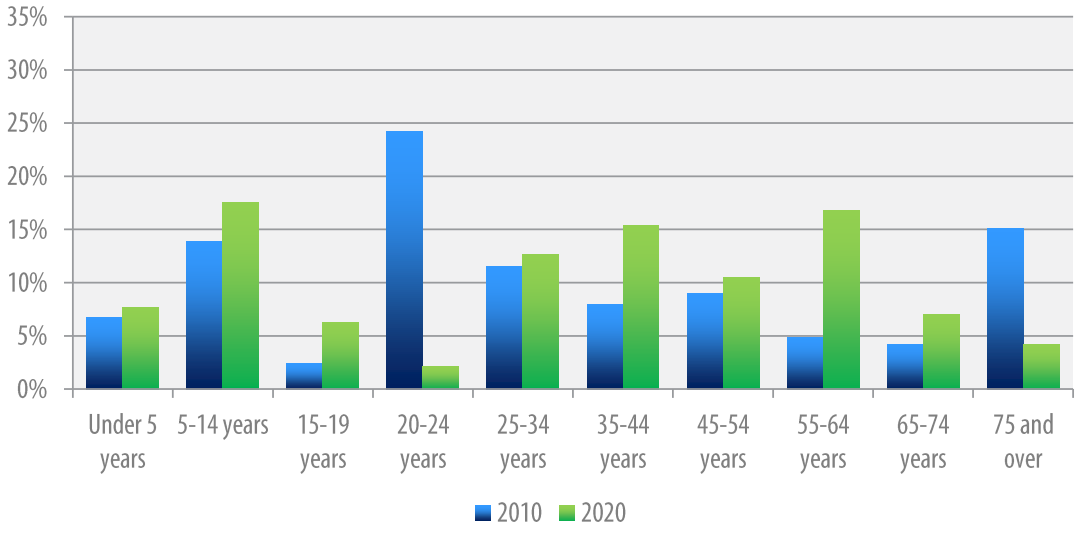
The size and composition of a community's population can exert influence on its development. For instance, population size, composition, and distribution influence the range of businesses a community can support, the pool of workers from which to draw, and the demand for and supply of services. Similarly, the effect people have on the social, economic, and physical environments depends upon the composition, expectations, and distribution of the population. A population's age distribution, income levels, ancestry, and educational attainment are some of the characteristics that mold a community. Population trends give community leaders and elected officials information on what kind of services need to be provided and offers prospective employers an overview of the local labor force.

Figure C.1: City of Brayton Historic Population, 1960-2020



Since 1960, the City of Brayton's population has decreased by 82 residents from 225 in 1960 to 143 in 2020. The most drastic decrease during this period happened from 1960 to 1970 when the city lost 32% (74 residents) of the population. Figure C.1 shows the City of Brayton's population trend since 1960.

Figure C.2: City of Brayton Age Distribution, 2010 & 2020



Brayton's population is becoming similar to other communities in the county, with a recent increase in older residents. Over 40% of the city's residents are aged between twenty and fifty-five, 28.0% of the population is fifty-five years or older, and the remaining 31.5% of the population is twenty years or younger. Figure C.2 displays the age of the city's population in 2020 compared to 2010.

Housing

A community's ability to attract new residents is important. One of the most important aspects to attracting residents is housing. A community's housing stock, type of households, and housing availability and affordability are determining factors.

Since 2010, the City of Brayton has lost 6 housing units. Renter-occupied units decreased by 11, while owner-occupied units decreased by 5. During the same period, the number of vacant units increased by 10.

Table C.1: City of Brayton Housing Units, 2010 & 2020

	2010		2020	
	Number	**Percent**	**Number**	**Percent**
Occupied Housing Units	62	88.57%	46	71.9%
Owner Occupied	47	75.81%	42	91.3%
Renter Occupied	15	24.19%	4	8.7%
Vacant Housing Units	8	11.43%	18	28.1%
Total Housing Units	70	100.00%	64	100.0%

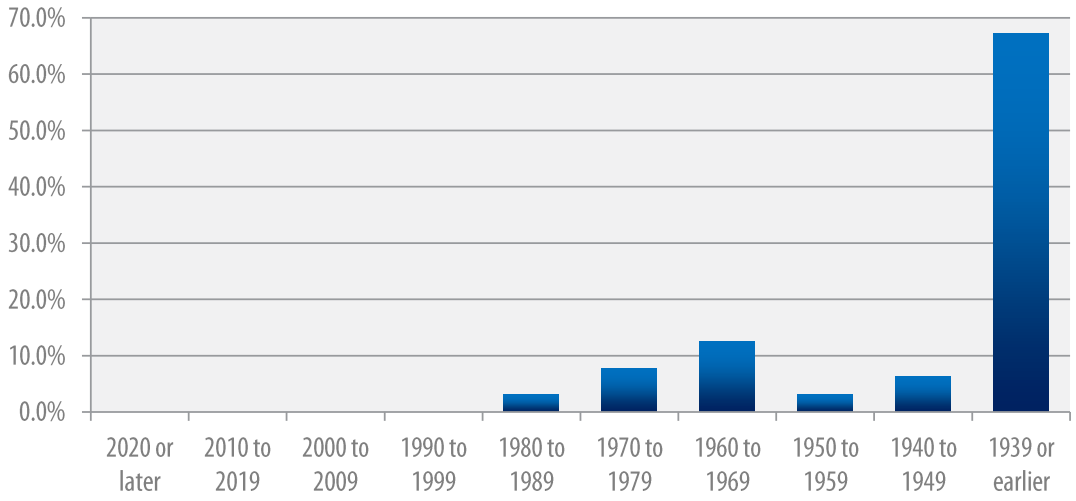
Table C.2: City of Brayton Value of Owner-Occupied Units, 2020

Value of Housing Unit	Percent of Homes
Less than $50,000	18.2%
$50,000 to $99,999	18.2%
$100,000 to $299,999	63.6%
$300,000 to $499,999	0.0%
$500,000 to $749,999	0.0%
$750,000 to $999,999	0.0%
$1,000,000 or more	0.0%

Brayton, like many other rural Iowa towns, has a lower median housing value of $127,100. The State of Iowa has a median housing value of $162,200. The city's homes can be very affordable, and the community is located within driving distance to larger employment centers which can be used to attract new residents. However, these homes may deteriorate faster and will need a number of repairs and updates. According to the 2022 American Community Survey Estimates, 18.2% of the city's homes are valued less than $50,000. A complete breakdown of the value of homes in Brayton can be found in Table C.2.

According to the 2022 American Community Survey Estimates, 67.2% of the city's homes were constructed before 1939. The 1960s experienced the second largest construction period, with 12.5% of the city's homes being built during this time. Figure C.3 shows the complete breakdown by decade. Building standards of today utilize the most recent construction materials and safety features, ensuring that the new residential structures are as safe as possible. This does not mean that older homes are more unsafe, just that they may be more susceptible to hazard damage.

Figure C.3: City of Brayton Year Housing Units Constructed, 2022



Economics

Household income is an important indicator of the economic base in Audubon County. In Brayton, the median household income is $73,750, which would classify a large number of the households in Brayton as "working" or "middle" class. Table C.3 breaks down the city's households by income. The City of Brayton's household income breakdown is similar to the other rural communities in the area, and the combination of more affordable housing with the current incomes generally provides residents with a decent quality of life. Educational services, and health care, and social assistance is the largest industry within the City, which is consistent with the County as a whole. Many employees commute to other larger neighboring cities like Atlantic, Carroll, and Harlan where more employment opportunities are present.

Table C.3: City of Brayton Household Income, 2022

Income and Benefits (2022 Inflation-Adjusted Dollars)	Number of Households	Percent of Households
Less than $10,000	2	4.3%
$10,000 to $14,999	0	0.0%
$15,000 to $24,999	3	6.5%
$25,000 to $34,999	9	19.6%
$35,000 to $49,999	5	10.9%
$50,000 to $74,999	4	8.7%
$75,000 to $99,999	12	26.1%
$100,000 to $149,999	6	13.0%
$150,000 to $199,999	1	2.2%
$200,000 or more	4	8.7%
Median Household Income	$73,750	-
Mean Household Income	$84,378	-

Brayton, overall, is a small rural community in a small rural county. A large percent of the businesses within the county serves the largely agricultural economy. Table C.4 breaks down what industry Brayton residents work in. Agriculture, forestry, fishing, hunting, and mining employ the second largest cohort of residents, with 20.0% of the city's residents being employed in this industry. Wholesale trade is the third largest industry, with 11.4%, followed by manufacturing and public administration, both with 5.7%.

Table C.4: City of Brayton Employment by Industry, 2022

Industry	Number	Percent
Total civilian non-farm employment, 16 years and over	70	100.0%
Agriculture, Forestry, Fishing, Hunting, Mining	14	20.0%
Construction	2	2.9%
Manufacturing	4	5.7%
Wholesale Trade	8	11.4%
Retail Trade	3	4.3%
Transportation and warehousing and utilities	0	0.0%
Information	2	2.9%
Finance and insurance, and real estate and rental and leasing	3	4.3%
Professional, scientific, management, administrative, and waste management services	2	2.9%
Educational, health care, and social assistance	24	34.3%
Arts, entertainment, recreation, accommodation, and food services	2	2.9%
Other services, except public administration	2	2.9%
Public Administration	4	5.7%

Existing Documents & Capabilities

The current planning and regulatory documents along with the year they were last updated for the City of Brayton can be found in Table C.5. The city of Brayton does not have a lot of regulatory requirements for development within the city. While the city does not have a large number of requirements, there is a thought process to development within the city. First and foremost, the previous hazard mitigation plan, as well as this document lays out specific strategies to help the city reduce the impact hazards have on the community and those who live in it. Floodplain regulations were adopted in 2024 and regulate the development in and around the city's flood zones. With a riverine that runs through the middle of the city, these are important to ensure that any new development does not happen in the flood zone and any improvements made, are done to standards to ensure that flooding or other hazards have minimal effects on structures. As Brayton has not seen new development in a number of years, these regulations are most widely used for rehabilitation/ improvement projects.

Table C.5: City of Brayton Existing Documents

Document	Yes/No	Year
Previous HMP	Yes	2019
Comprehensive Plan	No	-
Building Code	No	-
Zoning Ordinance	No	-
Strategic Plan	No	-
Housing Needs Assessment	Yes	1997
NFIP Participant	Yes	1976
Floodplain Regulations	Yes	2024

While the City of Brayton has experienced a population loss within the recent past, there is still room for improvement within the community. The part-time staff can continue to educate on mitigation actions and how to be more effective in response. Developing a comprehensive plan that would include disaster response steps based on disaster type or damage that occurs would be beneficial. A capital improvement plan would help the community plan for necessary infrastructure upgrades and create a more proactive system, not so demand-responsive. This would also allow the city to budget for improvements over time, instead of experiencing sticker-shock. Partnering with the local COG could help the city create a better plan moving forward and could assist with finding grant funding which would require less from the city and would allow additional projects to be completed in a timely manner. Brayton is a part of a few 28E agreements, and expanding the number of these agreements for additional services would be beneficial to all jurisdictions involved.

NFIP Participation

In the past, there have been instances of flooding within the city limits of Brayton. Brayton started participating in the NFIP in 1976, and the flood map was updated and approved in 2016. The city's FIRMs can be found in the later in this appendix. The Mayor is the City's Floodplain Administrator. Any development/demolition in the floodplain is required to obtain a permit which regulates the development/demolition and lays out the NFIP regulations that must be followed. Brayton participates in the NFIP and implements substantial improvement / substantial damage provisions in the following manner: Local officials (1) determine the cost of work, (2) determine the market value of buildings, (3) make SI/SD determinations and provide determinations to property owners, and (4) require owners to obtain permits to bring substantially improved and substantially damaged structures into compliance with the floodplain management requirements.

Outlook and Future Development

Since the last plan update, there has been a slight decline in the city's commercial atmosphere. During the same period, the city has begun work that will improve city infrastructure for all residents and businesses. Over this plan's lifespan, Brayton's population is likely to continue to decline slowly. Projects that have been in development will begin construction within this planning period. The city's vulnerability to hazards will remain the same throughout this planning period due to no major land changes or large developments being anticipated.

Critical Facilities

Critical facilities are facilities that are critical to the health and welfare of the population and are especially important following hazard events. Every jurisdiction is unique in such way that the list of critical facilities can vary widely from community to community. Brayton's critical facilities can be found on map C.2.

Table C.6: City of Brayton Essential Infrastructure and Services

Major Arterials	U.S. Highway 71	**Air Service**	Audubon County Airport
Water Service	Regional Water	**Sewer Service**	Municipal
Electric Service	MidAmerican Energy	**Gas Service**	MidAmerican Energy
Sanitation/Solid Waste	MTS Sanitation	**Landfill**	Carroll County Landfill
Phone and Internet	Marne Elk Horn Telephone, Mediacom, wireless	**Law Enforcement**	Audubon County Sheriff
Fire Service	Brayton Volunteer Fire Department	**Ambulance Service**	Exira Fire & Rescue

Essential Infrastructure and Services

Knowing what services and infrastructure serves the city can be beneficial in a time of disaster so the appropriate companies can be contacted in need of utility shutoff or updated transportation routes. The city's essential infrastructure and services can be found in table C.6.

Table C.7: City of Brayton Critical Facilities

Number on Map	Name	Address	Type
1	Brayton Lutheran Church	310 Broadway Street	Vulnerable Population
2	City Hall	202 County Road T	Essential Facility
3	Fire Station	309 County Road T	Essential Facility
4	First Baptist Church	400 Reynolds Street	Vulnerable Population
5	Post Office	200 County T Road	Essential Facility
6	Rural Water	West County T Road	Utility
7	Wastewater Lagoons	SE of Lincoln Street	Utility
8	Water Treatment	South of Depot Street	Utility
9	Wastewater Pump Station	South side of Town on US-71	Utility
10	Nutrien	504 Clinton Street	HAZMAT

Map C.2: City of Brayton Critical Facilities

Table C.8: City of Brayton Risk Assessment

Hazard	Comments
Animal/Plant/ Crop Disease	The City of Brayton contains a large amount of agricultural land. Although this land represents a large portion of the community, there have been minimal reported losses from animal/plant/crop disease within in the community. While this does impact the community, it is normally indirectly impacted.
Drought	Drought occurrences have increased across the state, and the City of Brayton has not been exempt from this hazard. Droughts continue to increase in severity and while there is little warning, this hazard can cause both direct and indirect issues for the City and it's residents.
Earthquake	There have been no instances of earthquake in the City of Brayton, and the committee feels there will be no instances during the life of this plan.
Expansive Soils	There have been no instances of expansive soils in the City of Brayton, and the committee feels there will be no instances during the life of this plan.
Extreme Heat	Extreme heat events impact the City of Brayton. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body.
Flash Flood	Since 2018, there have been no instances of flash flooding in the City of Brayton. While flash floods have little to no warning time, with no instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the community for response to an event.
Grass/Wild Land Fire	Grass and wild land fires are most commonly field fires or controlled burns that get out of hand ion and immediately surrounding the city. This hazard can pose a large threat to the community as elements out of anyone's control, such as wind direction and speed, can change this hazard from harmless and controlled to out of control in a matter of minutes and can pose a threat to life.
HAZMAT Incident	Within the most recent planning period, there was one instance of HAZMAT spills within Brayton. The spill threatened the soil. With one instance in five years, the committee feels this hazard poses a threat to the community and mitigation actions should be considered and implemented to prevent any further instances.
Human Disease	Iowa and more specifically the City of Brayton are still feeling the effects of the COVID-19 pandemic. The pandemic has reignited the need to plan for future outbreaks and examine the city's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.
Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the community to protect lives and property. The most likely infrastructure failure within Brayton would be structural failure of either bridges or roadways. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.

Levee/Dam Failure	There are no levees or dams located in the City of Brayton. It is unlikely that levee or dam failure will impact the city, although the city feels that planning for river flooding and planning for dam/levee failure are similar in nature.
Radiological	During the previous planning period, there were no instances of Radiological Incident in Brayton and the committee does not anticipate any happening in the next planning period. If an incident were to occur, the committee feels it would be a small, contained situation that would not threaten the community as a whole.
River Flooding	There is a small creek which runs through Brayton that has a small flood zone associated with it. Since 2018, there have been no reported instances of river flooding in Brayton. This hazard has a medium to low probability of effecting the community, and has historically not caused reportable damage within the community. Primary mitigation actions for this hazard would include limitations on construction in the flood zone.
Severe Winter Storm	Severe Winter Storms continue to impact the City of Brayton. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within the city. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the community.
Terrorism	There have been no instances of terrorism in the City of Brayton during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the community. While they are frequent, most storms pose no threat to life, crops, or property. This hazard is prevalent in Brayton but is normally not severe in nature.
Tornado	Audubon County has experienced a number of tornadoes in the recent past, and the two since the last plan update have impacted Brayton directly. With two tornadoes impacting the community in five years, it is important for the city to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. Preparing the public and community is vital to ensuring there is no loss of life.
Transportation Incident	Speed limits within the City of Brayton are relatively low. While the speed limits are lower throughout the community, US Highway 71 runs through town, and not all vehicles slow to the appropriate speed limit. With the community having lower speed limits, it is likely that any transportation incident between vehicles is likely to cause little damage to property or humans, but there is a chance of an incident which can cause extensive damage. The committee anticipates that this hazard will effect the community in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused reported damage to properties. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Brayton prompting the community to prepare more effectively for these hazards.

Table B.17: Hazards Not Affecting the City of Brayton

Hazard	Reason for Omission
Earthquake	Iowa as a whole has experienced the effects of few earthquakes in the past 175 years. The majority of the earthquakes were along the Mississippi River, therefore the city does not feel this hazard will impact them during this planning period.
Expansive Soils	While Iowa has expansive soils, due to the city's history of no issues in the past, the city felt this will not impact the jurisdiction over the life of this plan.

Table C.9: City of Brayton Maximum Building and Population Exposure

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	3	$462,550	145
Commercial	16	$530,652	
Industrial	0	$0	
Residential	61	$1,851,190	

It is unlikely that a jurisdiction can determine the impact any hazard will have. If a hazard were to impact the entire city, the numbers in table C.9 shows the number of people who would be affected and the maximum number of structures and their value. If this type of event were to occur, a shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability or even death.

The following hazards were determine to have a negligible impact on the city, if they were to occur.

Dam/Levee Failure	River Flooding
Landslide	Radiological

If a hazard were to report negligible impacts, it is anticipated that the numbers impacted would be similar to table C.10. If there were any shutdown of facilities or services, it is likely that these shutdowns would be for less than twenty-four hours. If any injuries were to occur, it is anticipated that these would be able to be treated with first aid. A negligible hazard would impact approximately 9% of the city.

Table C.10: City of Brayton Negligible Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	0	$0	13
Commercial	1	$47,759	
Industrial	0	$0	
Residential	5	$166,607	

The following hazards were determine to have a limited impact on the city, if they were to occur.

Thunderstorm/Lightning/Hail	Tornado
Windstorm	Grass/Wild Land Fire
Severe Winter Storms	Infrastructure Failure
Extreme Heat	HAZMAT Incident
Flash Flood	Transportation Incident

If a hazard were to report limited impacts, it is anticipated that the numbers impacted would be similar to table C.11. A shutdown of some facilities and services could last more than a week and any injuries/illnesses would not result in permanent disability. It is estimated that 25% of the city would be impacted.

Table C.11: City of Brayton Limited Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	1	$115,638	36
Commercial	4	$132,663	
Industrial	0	$0	
Residential	15	$462,798	

The following hazards were determine to have a limited impact on the city, if they were to occur.

Drought
Animal/Plant/Crop Disease
Human Disease

If a hazard were to report critical impacts, it is anticipated that the numbers impacted would be similar to table C.12. A shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability. It is estimated 50% of the city would be impacted.

Table C.12: City of Brayton Critical Hazard Impact

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	2	$231,275	73
Commercial	8	$265,326	
Industrial	0	$0	
Residential	31	$925,595	


JOINS PANEL 0237
JOINS PANEL 0250
LEGEND
NATIONAL FLOOD INSURANCE PROGRAM
NFIP
PANEL 0241D
FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA
AND INCORPORATED AREAS
PANEL 241 OF 300
MAP NUMBER 19009C0241D
EFFECTIVE DATE MAY 2, 2016
Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

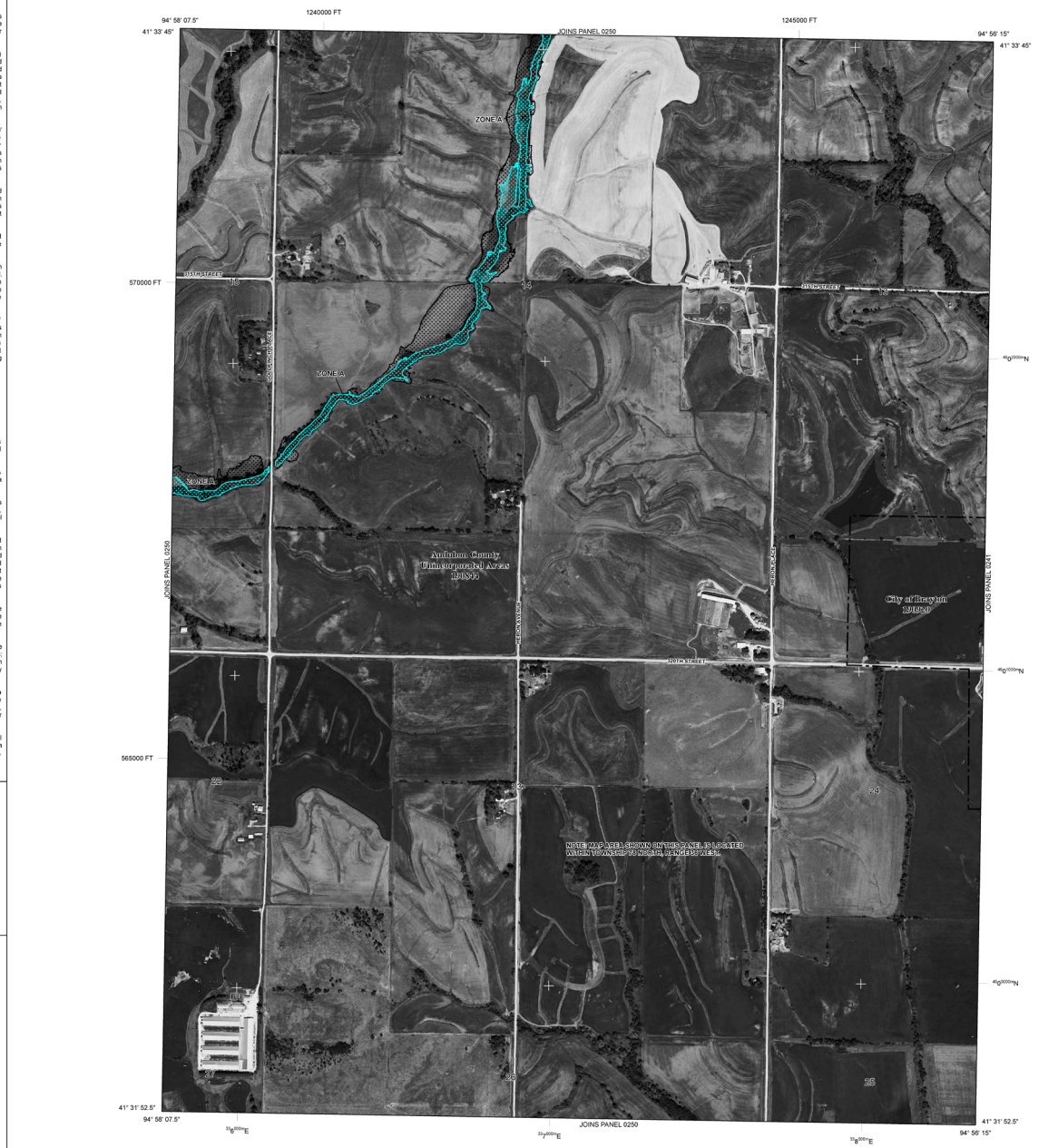
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A A Cross section line

23 23 Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

4990000 N 1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0237D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 237 OF 300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0237	D
BRAYTON, CITY OF	190920	0237	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0237D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

Table C.13: City of Brayton Status of Previous Mitigation Actions

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance			X		
Develop a replacement schedule for firefighting equipment			X		
Replace firefighting equipment as necessary			X		
Annually review the hazard mitigation plan			X		
Develop a replacement plan for emergency machinery				X	
Seek funding to upgrade and improve emergency machinery				X	
Acquire a generator to back-up the community for power outages				X	
Continue to train local volunteers as much as feasibly possible			X		
Seek funding for HAZMAT training			X		
Secure funding for a generator			X		
Evaluate, upgrade, and expand warning sirens		X			
Seek funding for updating HAZMAT equipment			X		

Action Plan

Section 201.6 (c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table C.14: City of Brayton Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other community assets from the effects of hazards**
Objective 1	Upgrade and improve emergency machinery
Objective 2	Keep volunteers safe during HAZMAT response
Objective 3	Keep emergency volunteers well-trained
Objective 4	Continue to reduce the damage amounts from flooding
Goal 2	**Minimize to the greatest possible extent the vulnerability of the people of Audubon County to the impacts of all identified hazards**
Objective 1	Acquire a back-up generator for the community
Objective 2	Provide adequate coverage with warning system
Goal 3	**Improve public communication, education, and awareness of hazards and their risks in Audubon County**
Objective 1	Track mitigation activities and changes to mitigation strategy

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance	Flash Flood, River Flooding	Medium	City Council	Minimal	City Funds	Property Protection	Ongoing
Develop a replacement schedule for firefighting equipment	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	City Council, Fire Department	Minimal	City Funds, Donations, FEMA AFG, Local Foundations	Emergency Services	Ongoing
Replace firefighting equipment as necessary	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council, Fire Department	Minimal	City Funds, Donations, FEMA AFG, Local Foundations	Emergency Services	Ongoing
Cooling centers during heat waves	Extreme Heat	Low	City Council, Audubon School District	Low	City Funds	Emergency Services	Short
Replace small culverts with larger culverts	Flash Flood	Medium	City Council, Public Works	Moderate	City Funds, County Funds, IDOT	Structural Project	Long

Table C.15: City of Brayton Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Annually review the hazard mitigation plan	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council	Minimal	City Funds	Public Education and Awareness	Ongoing
Acquire a generator to back-up the community for power outages	Infrastructure Failure	High	City Council	Minimal	City Funds, FEMA HMGP with State Cost Share, Local Foundations	Emergency Services	Short
Continue to train local volunteers as much as feasibly possible	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	City Council, Fire Department	Minimal	City Funds, FEMA AFG, Local Foundations	Emergency Services	Ongoing
Seek funding for HAZMAT training	HAZMAT Incident	Medium	City Council, Fire Department	Minimal	City Funds, FEMA AFG, Local Foundations	Emergency Services	Ongoing

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Secure funding for and purchase a generator for utility locations	Infrastructure Failure	High	City Council	Minimal	City Funds, FEMA HMGP, USDA Community Facilities, Local Foundations	Emergency Services	Short
Evaluate, upgrade, and expand warning sirens	Thunderstorm/Lightning/Hail, Windstorm, Tornado	Medium	City Council, Fire Department	Minimal	City Funds, FEMA HMGP, USDA Community Facilities Local Foundations	Emergency Services	Mid
Seek funding for updating HAZMAT equipment	HAZMAT Incident	Medium	Fire Department	Minimal	City Funds, FEMA, Local Foundations	Emergency Services	Ongoing
Ensure radios are kept updated to the newest technology	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	Fire Department	Low	City Funds, FEMA, Local Foundations	Emergency Services	Ongoing
Explore City obtaining it's own water supply & treatment facility	Drought, Infrastructure Failure, Terrorism	High	City Council, Engineering Firm	High	City Funds, Utility Revenue, Community Development Block Grant, USDA, SRF, Local Foundations	Structural Project	Long

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Develop and practice evacuation plans citywide	Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Terrorism, Transportation Incident	High	City Council, Fire Department	Minimal	City Funds	Prevention	Short
Bury power lines	Tornado, Severe Winter Storm, Thunderstorm/Lightning/Hail	Low	Power Company	High	City Funds, FEMA with State Cost Share	Prevention	Long

Incorporation into Other Planning Mechanisms

Where possible, Brayton will consider the findings from this document when updating or creating new planning and operating documents. Information from this plan will be utilized to update and expand the following documents:

- Hazard Mitigation Plan
- Zoning Ordinance
- Floodplain Regulations
- Housing Needs Assessment

While the city currently does not have any of the plans listed below, if these plans were to be created during the life of this plan, this plan will be used to guide the development of:

- Water Conservation Plans
- Storm Water Management Plans
- Parks and Recreation Plans
- Comprehensive Plan
- Building Code
- Strategic Plan

Resolution No. 12-10-01

Resolution Adopting Multi-Jurisdictional Hazard Mitigation Plan

A RESOLUTION OF THE CITY OF BRAYTON ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the City of Brayton participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the City of Brayton adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 10 **DAY OF** December **2024.**

Mayor

ATTEST:

City Clerk

Appendix D: City of Exira

Community Profile

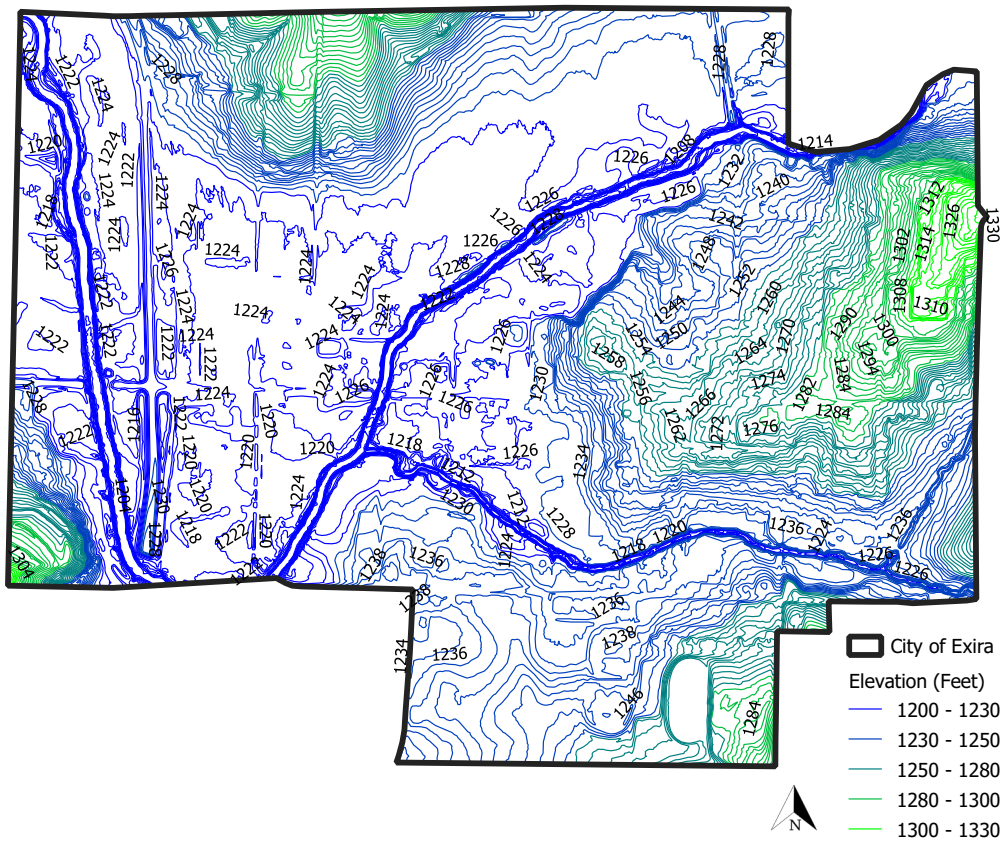
History

Founded in 1857, Exira is the oldest town in Audubon County. Exira was named for Exira Eckman, daughter of Judge John Eckman from Ohio, who agreed to purchase a large amount of property in the town if the town was named after his daughter. In 1913, the elementary school was completed followed by the high school in 1959. On July 2, 1958, the City of Exira was ravaged by the flooding of the East Nishnabotna River where nineteen local residents lost their lives, 75 homes were destroyed, and 20 businesses in the western part of the City were damaged.

Geography and Environment

The City of Exira is located in south central Audubon County. The East Nishnabotna River runs along the western boundary of the city. Highway 71 runs north to south along the western portion of the city and is the main transportation route.

Map D.1: City of Exira Elevation



The highest elevation in Audubon County can be found in the northwestern corner of the county. Here, the elevation can reach as much as 1,540 feet above sea-level. Exira's highest elevation is 1,330 feet above sea-level. The city's elevation only changes 130 feet from the highest point to the lowest point. Map D.1 shows Exira's elevation.

Demographics

The population of an area represents one of its most important assets. A population includes the labor force, entrepreneurs, taxpayers, and buyers of goods and services. This section will address several characteristics of Exira's population through past, present and future trends of the region.

The size and composition of a community's population can exert influence on its development. For instance, population size, composition, and distribution influence the range of businesses a community can support, the pool of workers from which to draw, and the demand for and supply of services. Similarly, the effect people have on the social, economic, and physical environments depends upon the composition, expectations, and distribution of the population. A population's age distribution, income levels, ancestry, and educational attainment are some of the characteristics that mold a community. Population trends give community leaders and elected officials information on what kind of services need to be provided and offers prospective employers an overview of the local labor force.

Figure D.1: City of Exira Historical Population, 1960-2020

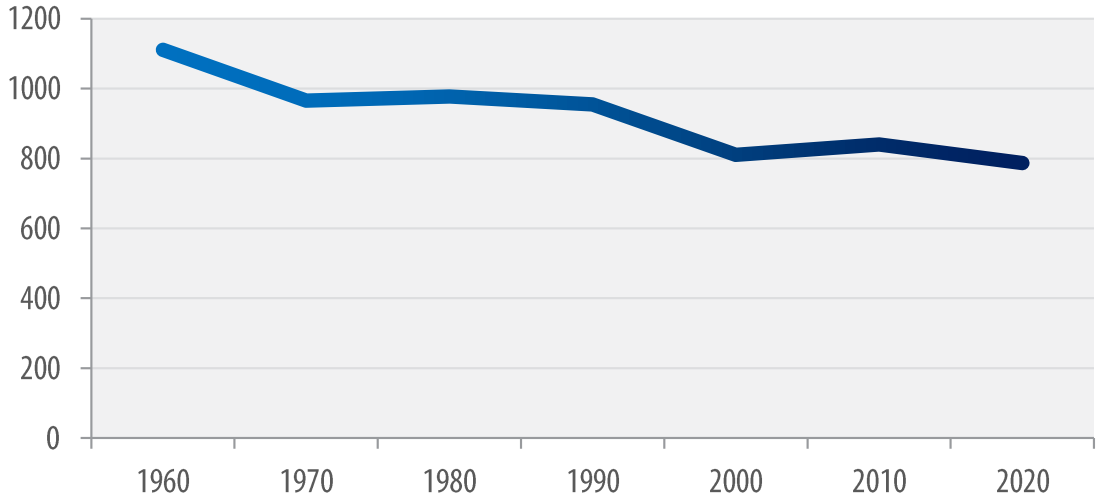
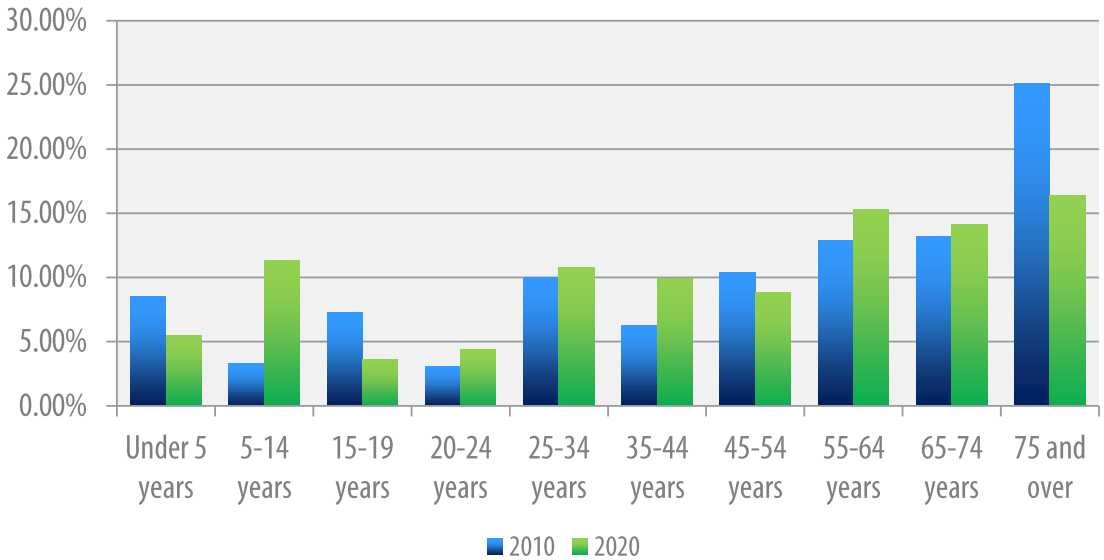


Figure D.2: City of Exira Age Distribution, 2010 & 2020



Since 1960, the City of Exira has lost 324 (29%) of its residents. Not only is the city losing population, its population is aging, similar to other rural Iowa cities. Over 40% of the city's population is aged 60 years or older.

The city's population makeup is not very different from other parts of Audubon Count, and even most of the State of Iowa. Population cohorts at age 50 and above have generally higher numbers than other younger cohorts. This information can be found in figure D.2. Exira has a larger spike in older cohorts, being 15.3% of the population between 55 and 64 years; 14.1% between 65 and 74 years; and 16.4% of the population being 75 and older.

Housing

A community's ability to attract new residents is important. One of the most important aspects to attracting residents is housing. A community's housing stock, type of households, and housing availability and affordability are determining factors.

From 2010 to 2022, the American Community Survey estimates that the City of Exira had 3 housing units constructed. Since these are estimates, these numbers may not be completely accurate. It is important to remember these are estimates when looking at vacancy rates as well. According to the ACS estimates, more residents of Exira became homeowners, while vacancy rates remained stable.

Table D.1: City of Exira Housing Units, 2010 & 2022

	2010		2022	
	Number	**Percent**	**Number**	**Percent**
Occupied Housing Units	381	90.28%	384	90.6%
Owner Occupied	297	77.95%	319	83.1%
Renter Occupied	84	22.05%	65	16.9%
Vacant Housing Units	41	9.72%	40	9.4%
Total Housing Units	422	100.00%	424	100.0%

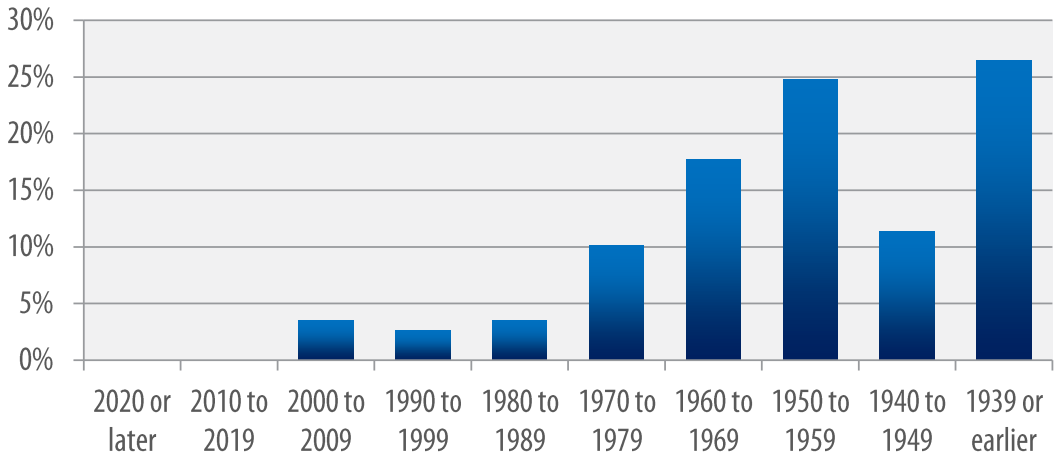
Table D.2: City of Exira Value of Owner-Occupied Units, 2022

Value of Housing Unit	Percent of Homes
Less than $50,000	28.5%
$50,000 to $99,999	39.8%
$100,000 to $149,999	18.8%
$150,000 to $199,999	4.7%
$200,000 to $299,999	4.4%
$300,000 to $499,999	2.5%
$500,000 to $999,999	1.3%
$1,000,000 or more	0.0%

The city has 28.5% of the homes valued less than $50,000 with an additional 39.8% valued between $50,000 and $99,999. These numbers help explain why Exira, like many other small rural towns in Iowa, has a lower median housing value of $69,100, which is $93,100 less than the State's median housing value of $162,200. Knowing information about the city's housing stock is useful after a disaster hits to determine how much damage was done, and how it will affect the city moving forward.

According to the 2022 American Community Survey Estimates, 26.4% of the homes in Exira were constructed in 1939 or earlier. The estimates show that there have been no new builds since 2010. Figure D.3 shows a steady decrease in homes built from 1950 to 1989 and a considerably lower number of homes built from 1940 to 1949. A complete breakdown of the year homes in Exira were constructed can be found in figure D.3. Building standards of today utilize the most recent construction materials and safety features, ensuring that the new residential structures are as safe as possible. This does not mean that older homes are more unsafe, just that they may be more susceptible to hazard damage.

Figure D.3: City of Exira Year Housing Units Constructed, 2022



Economics

Household income is an important indicator of the economic base in Audubon County. In Exira, the median household income is $43,229, which would classify a large number of households in Exira as "working" or "middle" class. Table D.3 breaks down the city's households by income. The City of Exira's household income breakdown is similar to the other rural communities in the area, and the combination of more affordable housing with the current incomes generally provides residents with a decent quality of life. The largest cohort (27.1%) of Exira's residents makes between $35,000 and $49,999. The next largest cohort represents 14.3% of the population and makes $50,000 to $74,999.

Table D.3: City of Exira Household Income, 2022

Income and Benefits (2016 Inflation-Adjusted Dollars)	Number of Households	Percent of Households
Less than $10,000	30	7.8%
$10,000 to $14,999	24	6.3%
$15,000 to $24,999	23	6.0%
$25,000 to $34,999	46	12.0%
$35,000 to $49,999	104	27.1%
$50,000 to $74,999	55	14.3%
$75,000 to $99,999	48	12.5%
$100,000 to $149,999	49	12.8%
$150,000 to $199,999	1	0.3%
$200,000 or more	4	1.0%
Median Household Income	$43,229	-
Mean Household Income	$58,943	-

Exira, overall, is a small rural community in a small rural county. A large percent of businesses within the county serves the largely agricultural economy. Table D.4 breaks down what industry Exira residents work in. The largest cohort of the population (29.2%) is employed in the educational, health care, and social assistance industry. Retail Trade is the second largest industry represented by workers in Exira, with 13.4% of the population working in this industry. Construction is the third largest, with 11.3% of the city's population, followed by Transportation, Warehousing, and Utilities, with 10.0%.

Table D.4: City of Exira Employment by Industry, 2022

Industry	Number	Percent
Total civilian non-farm employment, 16 years and over	380	100.0%
Agriculture, Forestry, Fishing, Hunting, Mining	17	4.5%
Construction	43	11.3%
Manufacturing	37	9.7%
Wholesale Trade	19	5.0%
Retail Trade	51	13.4%
Transportation and warehousing and utilities	38	10.0%
Information	16	4.2%
Finance and insurance, and real estate and rental and leasing	11	2.9%
Professional, scientific, management, administrative, and waste management services	9	2.4%
Educational, health care, and social assistance	111	29.2%
Arts, entertainment, recreation, accommodation, and food services	8	2.1%
Other services, except public administration	13	3.4%
Public Administration	7	1.8%

Existing Documents & Capabilities

The current planning and regulatory documents along with the year they were last updated for the City of Exira can be found in Table D.5. First and foremost, the previous hazard mitigation plan, as well as this document lays out specific strategies to help the city reduce the impact hazards have on the community and those who live in it. The City of Exira also has both a zoning code and comprehensive plan. These two documents work hand in hand to guide development within the community. The city's zoning code was created to keep certain zones away from one another to reduce the risk to humans and structures. The different zones can pose different threats to others, such as some industrial uses having a higher HAZMAT incident probability which if located in a residential zone, could pose large health issues to the overall population. The zoning codes also include information for street and sidewalk regulations which can reduce the number of transportation incidents. The City's Comprehensive Plan guides future zoning decisions and evaluates all aspects of the community and how these all interact with one another and creates an opportunity for the city to take inventory of the assets and think about mitigation of hazards at said assets. A portion of the City of Exira is located within a floodplain and the city's floodplain regulations help, in addition to the zoning, to regulate development in these areas. The City has largely dedicated flood zones to recreational and non-critical uses, so that if flooding were to occur, minimal damage is to happen. These regulations also dictate how buildings in the flood zone must be constructed/rehabilitated and the process for which development is to happen.

The City of Exira continues to be a more proactive community, which only benefits them in regards to mitigation of hazards. While the city has a current comprehensive plan, expanding this plan to really take inventory of the city's assets, utilities, and infrastructure would help the plan include a comprehensive disaster response section. A thorough capital improvement plan that has a focus on utility infrastructure would be beneficial as the city recently experienced a loss of water, and having a plan in place for a similar situation would allow the city to be proactive, not reactive. Expanding conversations with the local COG and engineering firms would allow the city to explore additional options that have worked in similar communities facing a similar situation. Outside organizations are also beneficial with finding funding for projects which otherwise may be out of the city's budget. The city has recently upgraded a large portion of their water infrastructure, but there are still some aspects that need assistance. Road and sewer infrastructure continues to need upgrades and pursuing funding opportunities could reduce impacts of hazards on these infrastructure types. Training staff to current required guidelines would allow for a more thought-out response to a hazard or hazard warning. Training staff regardless of responsibility on different departments can better prepare the city and can lead to things being noticed that previously went unnoticed.

Table D.5: City of Exira Existing Documents

Document	Yes/No	Year
Previous HMP	Yes	2019
Comprehensive Plan	Yes	2017
Building Code	No	-
Zoning Ordinance	Yes	2015
Strategic Plan	No	-
Housing Needs Assessment	Yes	1997
NFIP Participant	Yes	1974
Floodplain Regulations	Yes	2024

NFIP Participation

In the past, there have been instances of flooding within the city limits of Exira. Exira started participating in the NFIP in 1974, and the flood map was updated and adopted in 2016. The city's FIRMs can be found in the later in this appendix. The Zoning Administrator also acts as the Floodplain Administrator for the city. Any development/demolition in the floodplain is required to obtain a permit which regulates the development/demolition and lays out the NFIP regulations that must be followed. Exira participates in the NFIP and implements substantial improvement / substantial damage provisions in the following manner: Local officials (1) determine the cost of work, (2) determine the market value of buildings, (3) make SI/SD determinations and provide determinations to property owners, and (4) require owners to obtain permits to bring substantially improved and substantially damaged structures into compliance with the floodplain management requirements.

Outlook and Future Development

Since the last plan, there has been little development within the City of Exira. The residential portions of town have mostly seen the rehabilitation of structures with planning for new structure to be built. Within the city's commercial district, there also has been rehabilitation.

Throughout the life of this plan, the city anticipates housing development on an extremely limited scale, and anticipates that there will be additional rehabilitation occurring in the city's downtown district. The extremely limited housing development and only redevelopment in the city's downtown will keep the city's vulnerability unchanged over the planning period.

Table D.6: City of Exira Essential Infrastructure and Services

Major Arterials	U.S. Highway 71	**Air Service**	Audubon County Airport
Water Service	Regional Water District #1	**Sewer Service**	Municipal
Electric Service	MidAmerican Energy	**Gas Service**	MidAmerican Energy
Sanitation/Solid Waste	Local Haulers	**Landfill**	Carroll County Landfill
Phone and Internet	Marne Elk Horn Telephone, Windstream, Wireless	**Law Enforcement**	Audubon County Sheriff
Fire Service	Exira Fire Department (volunteer)	**Ambulance Service**	Exira Fire & Rescue

Essential Infrastructure and Services

Knowing what services and infrastructure serves the city can be beneficial in a time of disaster so the appropriate companies can be contacted in need of utility shutoff or updated transportation routes. The city's essential infrastructure and services can be found in table D.6.

Exira-EHK Community School District

The Exira-EHK Community School District has buildings in Exira and Elk Horn (Shelby County). The Exira Building is located at 105 East School Street. Grades Pre-K-5 attend school in Exira. The location of the Exira building can be found in map D.2. "The mission of the Exira-EHK Community School District is utilizing the strengths and resources of the whole community, is to promote academic excellence, 21st Century Skills, and Positive Character Development." On July 1, 2014, the Exira and EHK school districts merged to form one school district. Which can be shown in table D.7 which shows enrollment for the Exira building.

Students and staff participate in drills and educational programs related to hazards and the mitigation of them. The District maintains its own equipment and supplies to maintain roads and walkways on campus.

Table D.7: Exira-EHK Community School District Enrollment

School Year	Facility	Enrollment	Total Enrollment
2018-19	Exira EHK Elementary	187	404
2019-20	Exira EHK Elementary	188	400
2020-21	Exira EHK Elementary	178	362
2021-22	Exira EHK Elementary	196	384
2022-23	Exira EHK Elementary	198	394

Table D.8: City of Exira Critical Facilities

Number on Map	Name	Address	Type
1	City Hall	108 E Washington Street	Essential Facility
2	Exira Care Center	411 S Carthage Street	Vulnerable Population
3	Exira Christian Church	201 E. Main Street	Vulnerable Population
4	Exira Lutheran Church	106 E Harrison Street	Vulnerable Population
5	Exira-EHK Elementary School	105 E School Street	Vulnerable Population
6	Museum	Corner of E Washington Street and S Edgerton Street	Vulnerable Population
7	Fire Station (also a storm shelter)	508 W Washington Street	Essential Facility
8	Holy Trinity Catholic Church	208 N Kilworth Street	Vulnerable Population
9	Marne-Elk Horn Telephone	Harrison Street	Utility
10	Caseys	312 W Washington	HAZMAT
11	Exira Event Center	106 N Jefferson Street	Public
12	New Century FS	Corner of W Washington Street and W South Street	HAZMAT
13	Storm Siren	South of E Harrison and West of N Kilworth Street	Essential Facility
14	Sunset View Apartments	West of School Street	Vulnerable Population
15	Wastewater Lift Station	S Broadway Street	Utility
16	Water Tower	North of Knutsen Street	Utility
17	Windstream	South of W Washington Street and East of Florence Street	Utility
18	Landus Cooperative	Various	HAZMAT

Map D.2: City of Exira Critical Facilities

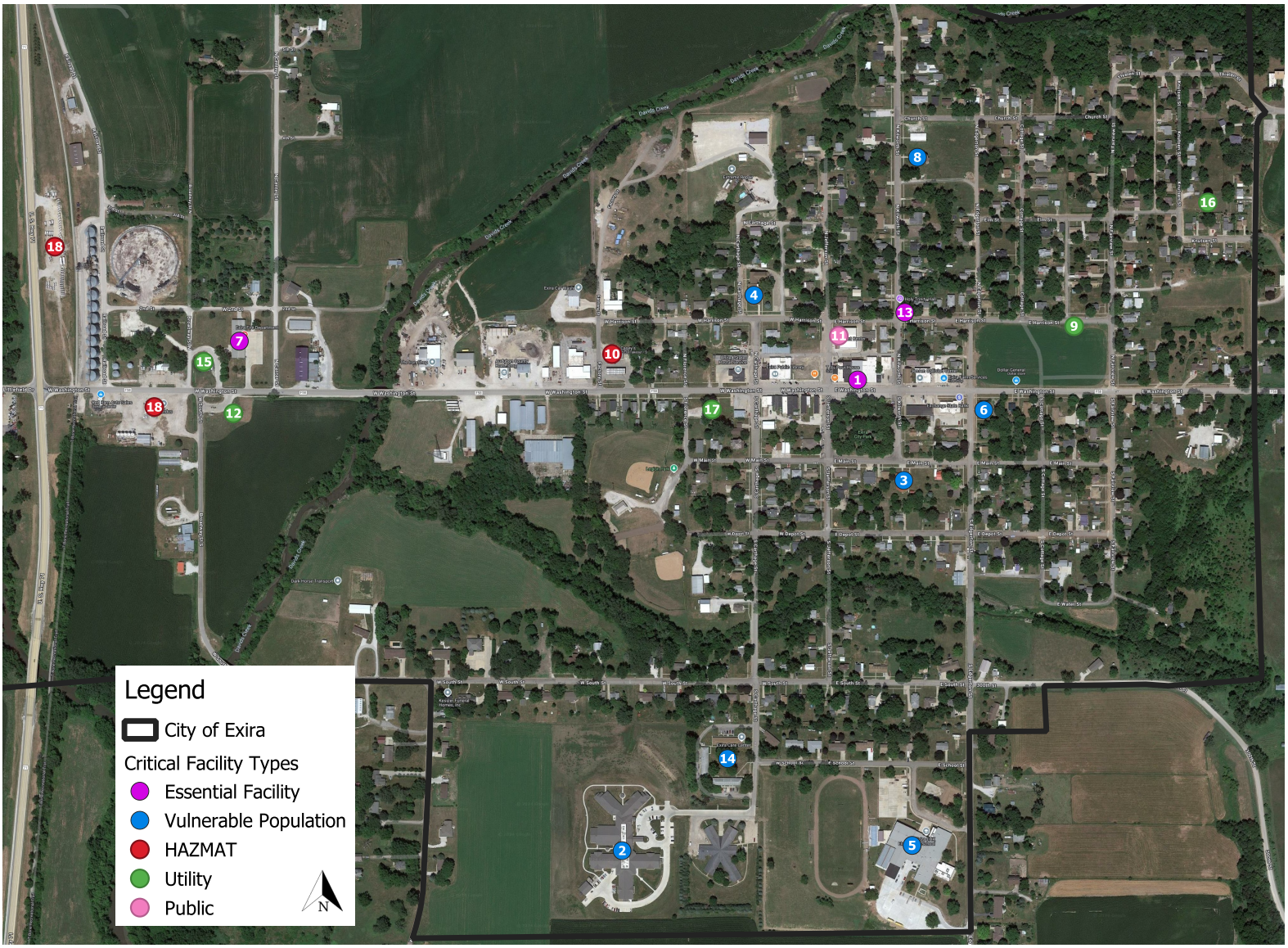


Table D.9: City of Exira Risk Assessment

Hazard	Comments
Animal/Plant/Crop Disease	The City of Exira contains a large amount of agricultural land. Although this land represents a large portion of the community, there have been minimal reported losses from animal/plant/crop disease within in the community. While this does impact the community, it is normally indirectly impacted.
Drought	Drought occurrences have increased across the state, and the City of Exira has not been exempt from this hazard. Droughts continue to increase in severity and while there is little warning, this hazard can cause both direct and indirect issues for the City and it's residents.
Earthquake	There have been no instances of earthquake in the City of Exira, and the committee feels there will be no instances during the life of this plan.
Expansive Soils	There have been no instances of expansive soils in the City of Exira, and the committee feels there will be no instances during the life of this plan.
Extreme Heat	Extreme heat events impact the City of Exira. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body.
Flash Flood	Since 2018, there have been no instances of flash flooding in the City of Exira. While flash floods have little to no warning time, with no instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the community for response to an event.
Grass/Wild Land Fire	Grass and wild land fires are most commonly field fires or controlled burns that get out of hand in and immediately surrounding the city. This hazard can pose a large threat to the community as elements out of anyone's control, such as wind direction and speed, can change this hazard from harmless and controlled to out of control in a matter of minutes and can pose a threat to life.
HAZMAT Incident	Within the most recent planning period, there have been no instances of hazardous spills within the City of Exira. With no instances in five years, the committee feels this hazard is a minimal threat to the community and mitigation actions could be considered and implemented to prevent any instances.
Human Disease	Iowa and more specifically the City of Exira are still feeling the effects of the COVID-19 pandemic. The pandemic has reignited the need to plan for future outbreaks and examine the city's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.
Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the community to protect lives and property. The most likely infrastructure failure within Exira would be structural failure of either bridges or roadways. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.

Levee/Dam Failure	There are no levees or dams located in the City of Exira, and there are no high hazard dams on waterways that lead into the city. It is unlikely that levee or dam failure will impact the city, although the city feels that planning for river flooding and planning for dam/levee failure are similar in nature.
Radiological	During the previous planning period, there were no instances of Radiological Incident in Exira and the committee does not anticipate any happening in the next planning period. If an incident were to occur, the committee feels it would be a small, contained situation that would not threaten the community as a whole.
River Flooding	Within Exira, there is a portion of land located in the flood zone. Since 2018, there have been no reported instances of river flooding in Exira. This hazard has a medium probability of effecting the community, and has historically not caused significant reportable damage within the community. Primary mitigation actions for this hazard would include limitations on construction in the flood zone.
Severe Winter Storm	Severe Winter Storms continue to impact the City of Exira. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within the city. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the community.
Terrorism	There have been no instances of terrorism in the City of Exira during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the community. While they are frequent, most storms pose no threat to life, crops, or property. This hazard is prevalent in Exira but is normally not severe in nature.
Tornado	Audubon County has experienced a number of tornadoes in the recent past, but these have not caused large damage within the city. With the number of tornadoes that impact Audubon County growing, it is important for the city to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. Preparing the public and community is vital to ensuring there is no loss of life.
Transportation Incident	Speed limits within the City of Exira are relatively low. While the speed limits are lower throughout the community, US Highway 71 runs through town, and not all vehicles slow to the appropriate speed limit. With the community having lower speed limits, it is likely that any transportation incident between vehicles is likely to cause little damage to property or humans, but there is a chance of an incident which can cause extensive damage. The committee anticipates that this hazard will effect the community in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused reported damage to properties. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Exira prompting the community to prepare more effectively for these hazards.

Table B.17: Hazards Not Affecting the City of Exira

Hazard	Reason for Omission
Earthquake	Iowa as a whole has experienced the effects of few earthquakes in the past 175 years. The majority of the earthquakes were along the Mississippi River, therefore the city does not feel this hazard will impact them during this planning period.
Expansive Soils	While Iowa has expansive soils, due to the city's history of no issues in the past, the city felt this will not impact the jurisdiction over the life of this plan.

Table D.10: City of Exira Maximum Building and Population Exposure

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	5	$399,977	787
Commercial	72	$2,672,502	
Industrial	0	$0	
Residential	391	$12,351,488	

It is unlikely that a jurisdiction can determine the impact any hazard will have. If a hazard were to impact the entire city, the numbers in table D.10 shows the number of people who would be affected and the maximum number of structures and their value. If this type of event were to occur, a shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability or even death.

The following hazards were determine to have a negligible impact on the city, if they were to occur.

Dam/Levee Failure	Radiological
Landslide	Transportation Incident

If a hazard were to report negligible impacts, it is anticipated that the numbers impacted would be similar to table D.11. If there were any shutdown of facilities or services, it is likely that these shutdowns would be for less than twenty-four hours. If any injuries were to occur, it is anticipated that these would be able to be treated with first aid. A negligible hazard would impact approximately 9% of the city.

Table D.11: City of Exira Negligible Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	0	$35,998	71
Commercial	6	$240,525	
Industrial	0	$0	
Residential	35	$1,111,634	

The following hazards were determine to have a limited impact on the city, if they were to occur.

Thunderstorm/Lightning/Hail	Tornado
Windstorm	Grass/Wild Land Fire
Severe Winter Storms	Infrastructure Failure
Extreme Heat	HAZMAT Incident
Flash Flood	River Flooding

If a hazard were to report limited impacts, it is anticipated that the numbers impacted would be similar to table D.12. A shutdown of some facilities and services could last more than a week and any injuries/illnesses would not result in permanent disability. It is estimated that 25% of the city would be impacted.

Table D.12: City of Exira Limited Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	1	$99,994	197
Commercial	18	$668,126	
Industrial	0	$0	
Residential	98	$3,087,872	

The following hazards were determine to have a limited impact on the city, if they were to occur.

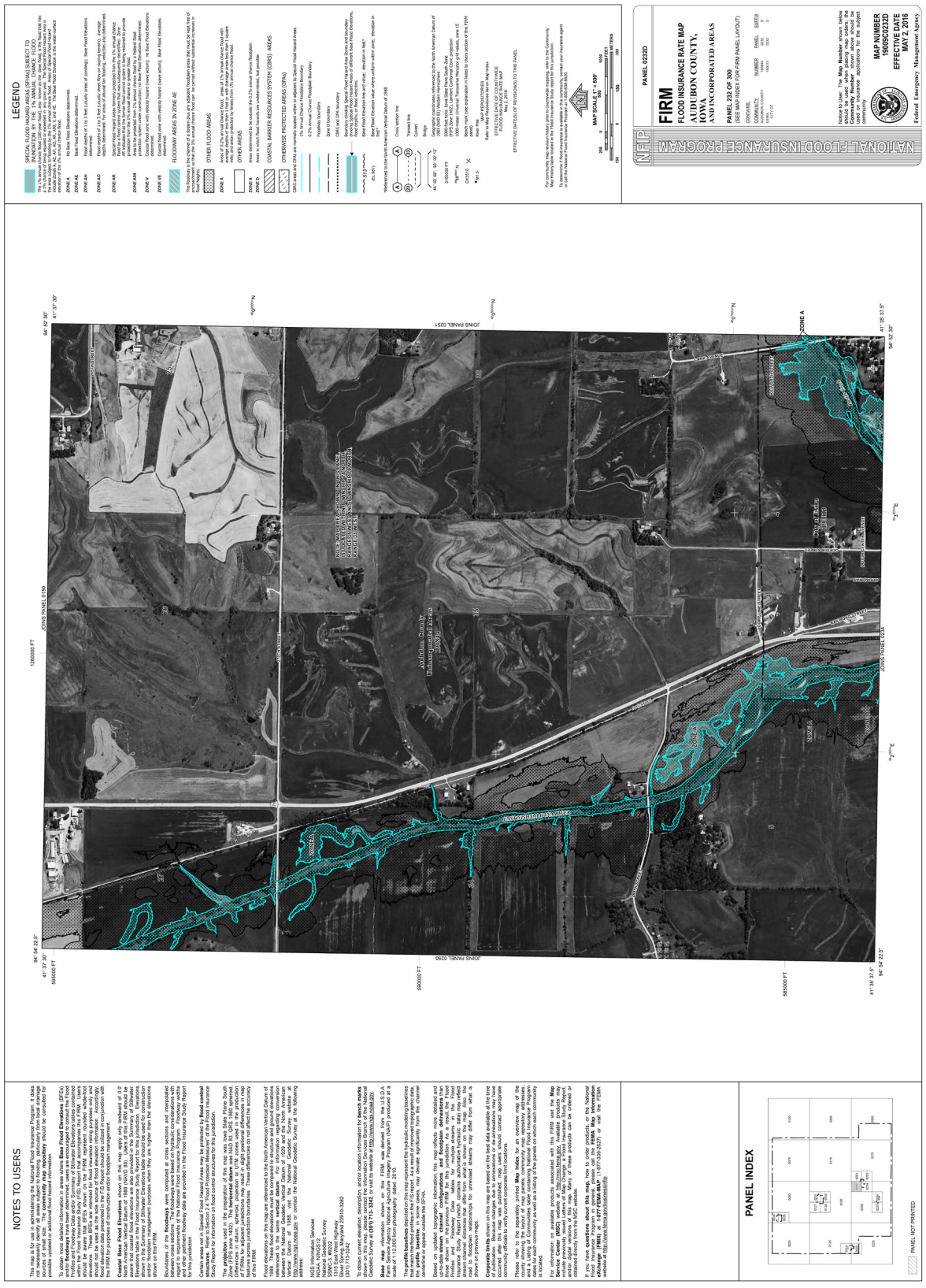
Drought
Animal/Plant/Crop Disease
Human Disease

If a hazard were to report critical impacts, it is anticipated that the numbers impacted would be similar to table D.13. A shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability. It is estimated 50% of the city would be impacted.

Table D.13: City of Exira Critical Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	3	$199,989	394
Commercial	36	$1,336,251	
Industrial	0	$0	
Residential	196	$6,175,744	

Flood Maps


LEGEND
SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of special flood hazard include Zones A, AE, AH, AO, A1-A30, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
ZONE A — No Base Flood Elevations determined.
ZONE AE — Base Flood Elevations determined.
ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE A99 — Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE AR — Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE AR/A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
OTHER FLOOD AREAS
ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
OTHER AREAS
ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
1% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
Base Flood Elevation line and value; elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet*
*Referenced to the North American Vertical Datum of 1988
Cross section line
Transect line
Geodetic control point
Bridge
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
1000-meter Universal Transverse Mercator grid values, zone 15
5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
Bench mark (see explanation in Notes to Users section of this FIRM panel)
DX5510 ×
M1.5
MAP REPOSITORIES
Refer to Map Repositories list on Map Index
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016
EFFECTIVE DATES OF REVISIONS TO THIS PANEL
For communities whose revisions letters prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.
MAP SCALE 1" = 500'
250 0 500 1000 FEET
100 0 150 300 METERS
PANEL 0232D
FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS
PANEL 232 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER / PANEL / SUFFIX
AUDUBON COUNTY 190944 0232 D
CITY OF EXIRA 190945 0232 D
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19009C0232D
EFFECTIVE DATE
MAY 2, 2016
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
NFIP
NOTES TO USERS
This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.
To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.
Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.
Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.
Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.
The projection used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The horizontal datum was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the preparation of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.
Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:
NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242
To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.
Base map information shown on this FIRM was derived from the U.S.D.A. Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplain boundaries were transferred from the FIS report. As a result of improved topographic data, the profile baseline, in some cases, may deviate significantly from the channel centerline that appeared on the previous map.
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.
Please refer to the separately printed Map Index for an overview map of the county showing the layout of maps it contains, a community map repository list, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.
For information on available products associated with this FIRM visit the Map Service Center (MSC) website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.
If you have questions about this map, how to order products, or the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.
PANEL INDEX
PANEL NOT PRINTED
94° 54' 22.5"
41° 37' 30"
580000 FT
1260000 FT
JOINS PANEL 0160
JOINS PANEL 0250
JOINS PANEL 0251
JOINS PANEL 0234
94° 52' 30"
41° 35' 37.5"
ZONE A
Audubon County Unincorporated Areas 190943
City of Exira 190945
Exira Municipal Airport
Exira Cemetery
Exira Golf Course
Exira Elementary School
Exira Public Library
Exira Fire Department
Exira Post Office
Exira Community Center
Exira Swimming Pool
Exira Water Tower
Exira Sewage Lagoons
Exira Recreation Area
Exira Baseball Field
Exira Football Field
Exira Tennis Courts
Exira Skate Park
Exira Dog Park
Exira Picnic Area
Exira Playground
Exira Basketball Court
Exira Volleyball Court
Exira Soccer Field
Exira Track
Exira Bleachers
Exira Concession Stand
Exira Restrooms
Exira Parking Lot
Exira Entrance Sign
Exira Flagpole
Exira Memorial
Exira Veterans Memorial
Exira Historical Marker
Exira Museum
Exira Gift Shop
Exira Antique Mall
Exira Coffee Shop
Exira Restaurant
Exira Bar
Exira Grocery Store
Exira Hardware Store
Exira Pharmacy
Exira Bank
Exira Insurance Agency
Exira Real Estate Office
Exira Law Office
Exira Medical Clinic
Exira Dental Office
Exira Veterinary Clinic
Exira Auto Repair Shop
Exira Gas Station
Exira Car Wash
Exira Laundromat
Exira Beauty Salon
Exira Barber Shop
Exira Florist
Exira Gift Shop
Exira Antique Mall
Exira Coffee Shop
Exira Restaurant
Exira Bar
Exira Grocery Store
Exira Hardware Store
Exira Pharmacy
Exira Bank
Exira Insurance Agency
Exira Real Estate Office
Exira Law Office
Exira Medical Clinic
Exira Dental Office
Exira Veterinary Clinic
Exira Auto Repair Shop
Exira Gas Station
Exira Car Wash
Exira Laundromat
Exira Beauty Salon
Exira Barber Shop
Exira Florist

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

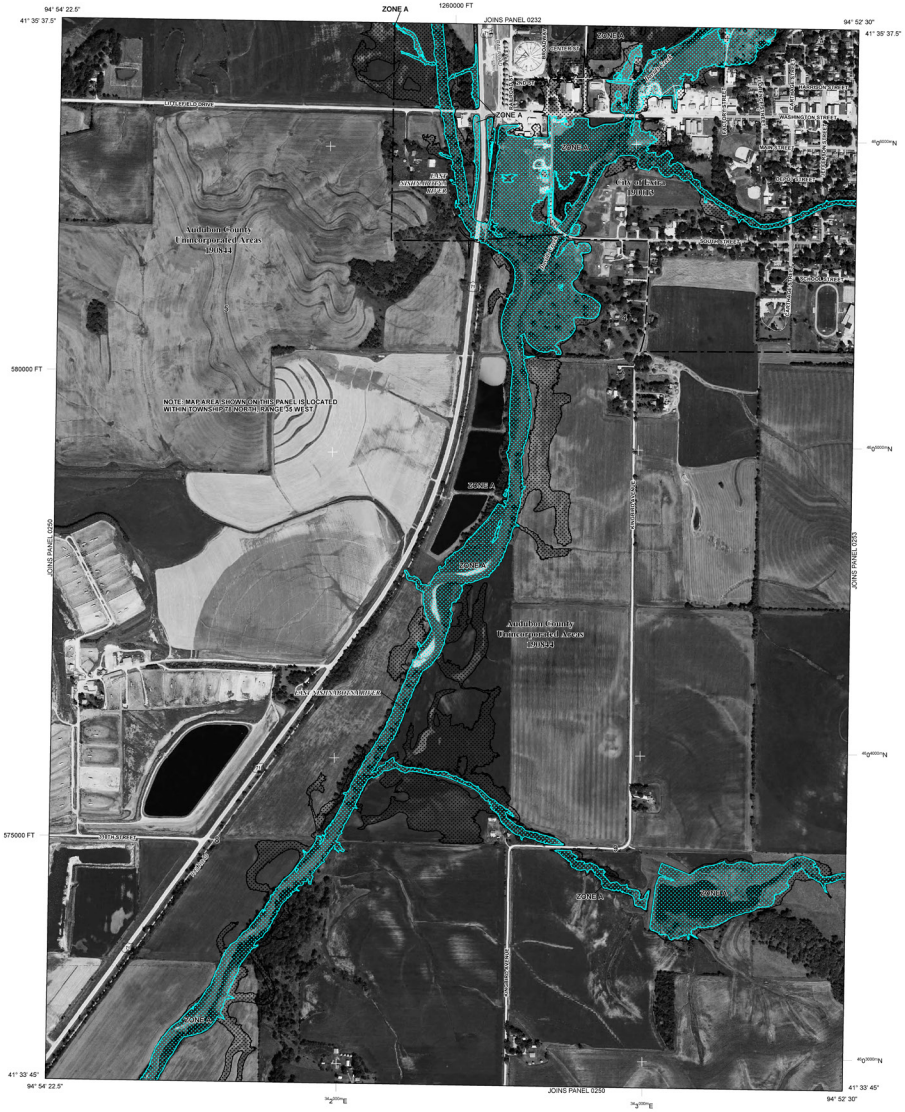
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 03' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 4690000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- BM 5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0234D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 234 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0234	D
EXIRA, CITY OF	190013	0234	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0234D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

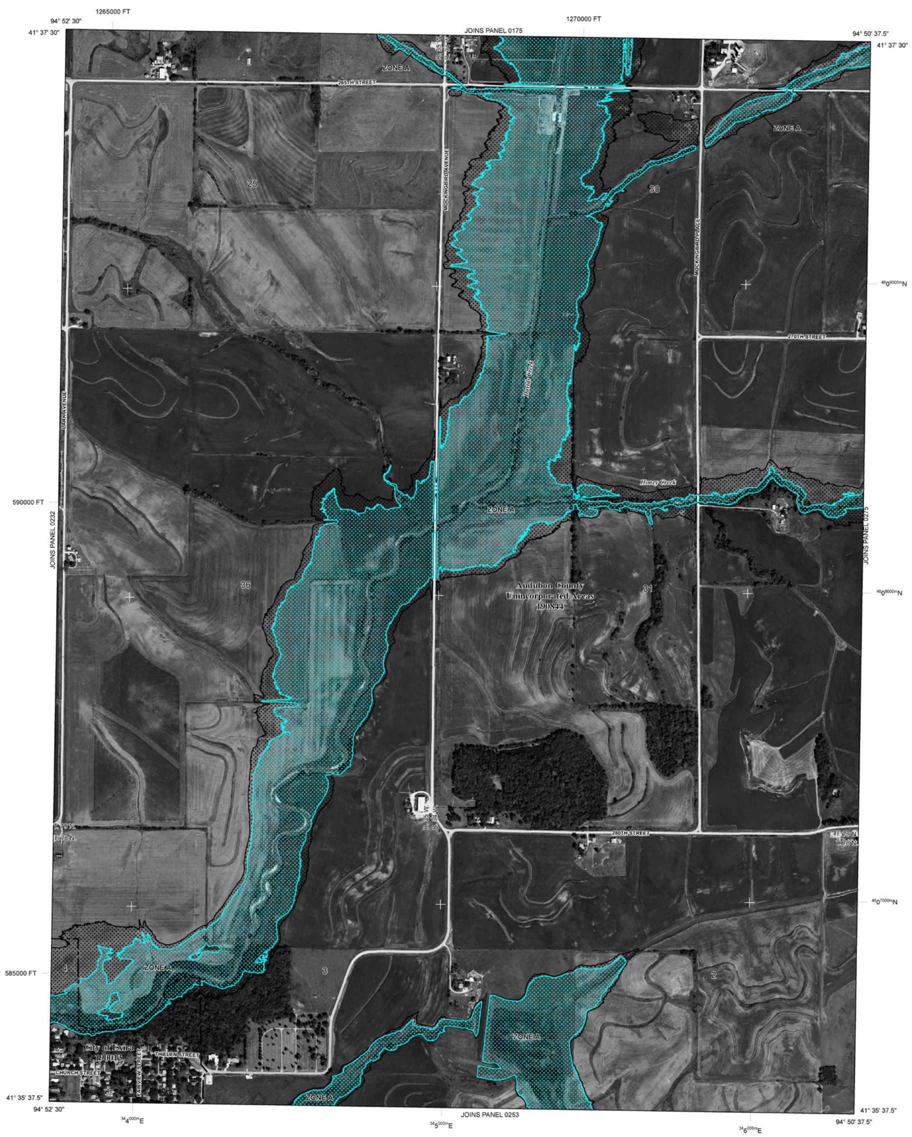
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)——(A)	Cross section line
(23)- - - -(23)	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT	5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
$^{49}89^{000m}$ N	1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0251D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA
AND INCORPORATED AREAS

PANEL 251 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0251	D
EXIRA, CITY OF	190013	0251	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0251D

EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A — Cross section line
23 — 23 — Transect line
Culvert
Bridge
45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
4640000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0253D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 253 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190644	0253	D
EXIRA, CITY OF	190013	0253	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0253D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

Table D.14: City of Exira Status of Previous Mitigation Actions

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance			X		
Replace small culverts with larger culverts				X	
Continue to regulate the floodplain			X		
Continue emergency volunteer training at current level			X		
Annually review the disaster mitigation plan				X	
Encourage use of NOAA weather radios			X		
Train volunteers for water rescue			X		
Purchase water rescue equipment	X				
Replace Bridges		X			

Action Plan

Section 201.6 (c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table D.15: City of Exira Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other community assets from the effects of hazards**
Objective 1	Reduce the damage amounts from flooding
Goal 2	**Minimize to the greatest possible extent the vulnerability of the people of Audubon County to the impacts of all identified hazards**
Objective 1	Train and equip emergency volunteers regularly
Objective 2	Improve public warnings
Objective 3	Prepare volunteers for water rescue calls
Goal 3	**Improve public communication, education, and awareness of hazards and their risks in Audubon County**
Objective 1	Annually review the disaster mitigation plan

Table D.16: City of Exira Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance	Flash Flood, River Flood	Medium	City Council, County Emergency Management	Minimal	City Funds	Prevention	Ongoing
Replace small culverts with larger culverts	Flash Flood	Medium	City Council, Public Works	Moderate	City Funds, County Funds, IDOT	Structural Project	Long
Continue to regulate the floodplain, amend floodplain regulations to include areas of reptitive flooding (even if not in designated floodplain)	Flash Flood, River Flood, Levee/Dam Failure	Medium	City Council, County Emergency Management	Minimal	City Funds, Iowa Floodplain Management	Prevention	Ongoing
Continue emergency volunteer training at current level	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	Fire Department, Emergency Services	Minimal	City Funds, Local Foundations, FEMA AFG	Emergency Services	Ongoing
Partner with Iowa DNR to further assess dam-related risk, and to expand dam safety planning measures	Dam/Levee Failure	Medium	City Council, Audubon County, Iowa DNR	Low	City Funds, County Conservation, IDNR	Prevention	Short
Seek to acquire land within inundatrion zone/flood zone	Dam/Levee Failure, River Flooding	Medium	City Council	Moderate	City Funds	Prevention	Long

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Explore City obtaining it's own water supply & treatment facility	Drought, Infrastructure Failure, Terrorism	High	City Council	High	City Funds, Utility Revenue, Community Development Block Grant, USDA, SRF, Local Foundations	Structural Project	Long
Annually review the disaster mitigation plan	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	City Council	Minimal	City Funds	Prevention	Ongoing
Encourage use of NOAA weather radios	Tornado, Windstorm, Winter Storm, Thunderstorm/Lightning/ Hail	Medium	City Council, Fire Department, Police Department	Minimal	City Funds	Emergency Services	Ongoing
Train volunteers for water rescue	Flash Flood, River Flood, Levee/Dam Failure	Medium	Fire Department, Emergency Services	Minimal	City Funds, FEMA AFG, County Funds	Emergency Services	Ongoing
Replace Bridges	Transportation Incident	Medium	City Council, County, IDOT	High	City Funds, County Funds, IDOT, USFHWA	Prevention, Structural Project	Long

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Purchase a pump to allow for utilization of dry hydrants	Drought, Extreme Heat, Grass/Wild Land Fire, HAZMAT Incident, Infrastructure Failure, Transportation Incident	High	Fire Department	Minimal	Fire Department, Local Foundations, FEMA HMGP	Emergency Services	Short
Construct a tornado safe room at the school	Infrastructure Failure, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Windstorm	High	Exira EHK School, City Council, County EMA	High	City Funds, Exira-EHK School, FEMA HMGP, Local Foundations, USDA	Structural Project	Long
Install an additional storm siren to ensure full-town coverage	Tornado, Windstorm, Winter Storm, Thunderstorm/Lightning/ Hail	High	City Council	Low	City Funds, USDA Community Facilities, FEMA HMGP, Local Foundations	Emergency Services	Short
Install a lift station at all utility locations	Infrastructure Failure	High	City Council	Moderate	City Funds, USDA Community Facilities, FEMA HMGP, Local Foundations, Community Development Block Grant	Structural Project	Short
Recruit and train additional volunteers for fire and EMS. These individuals are the city's first responders during hazard events, and proper training can ultimately save lives and property if trained how to respond to diverse situations	Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	Fire Department, EMS, City Council, County EMA	Minimal	City Funds, Fire Department Budget, EMS Budget, Local Foundations, FEMA AFG	Emergency Services	Ongoing

Table D.17: Exira-EHK Community Schools Risk Assessment

Hazard	Comments
Extreme Heat	Extreme heat events continue to impact Exira and the Exira-EHK Community School District. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body.
Flash Flood	Since 2018, there have been no instances of flash flooding in the City of Exira. While flash floods have little to no warning time, with no instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the community for response to an event.
Human Disease	Iowa and more specifically the City of Exira are still feeling the effects of the COVID-19 pandemic. The school district continues to have certain precautions and policies in place to better protect students and faculty. The pandemic has reignited the need to plan for future outbreaks and examine the city and school's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.
Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the community to protect lives and property. The most likely infrastructure failure within the Exira-EHK School District would be structural failure of either bridges or roadways. These failures would impact busing primarily. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.
Severe Winter Storm	Severe Winter Storms continue to impact the City of Exira and the School District. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within the city. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the community. These instances can require the school to be able to change schedules and bus routing to ensure the safety of the children.
Terrorism	There have been no instances of terrorism in the City of Exira or the Exira-EHK Community School District during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the community. While they are frequent, most storms pose no threat to life or property. This hazard is prevalent in Exira but is normally not severe in nature.
Tornado	Audubon County has experienced a number of tornadoes in the recent past, but the City of Exira has not been impacted directly. While the city has not experienced any tornadoes within the past planning period, it is important for the city to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. Preparing the public and community is vital to ensuring there is no loss of life.

Transportation Incident	Speed limits within the majority of the City of Exira are relatively low, but portions of the school district have higher speed limits. With a portion of the district having lower speed limits, it is likely that any transportation incident between vehicles is likely to cause little damage to property or humans, but there is a chance of an incident which can cause extensive damage. The committee anticipates that this hazard will effect the district in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused reported damage to properties. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Exira prompting the community to prepare more effectively for these hazards.

Exira-EHK Community Schools Action Plan

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table D.18: Exira-EHK Community Schools Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other school assets from the effects of hazards**
Objective 1	Improve early warning signs
Objective 2	Improve infrastructure
Objective 3	Provide back-up assistance for all critical systems
Goal 2	**Minimize to the greatest possible extent the vulnerability of the students and visitors to the Exira-EHK Community Schools to the impacts of all identified hazards**
Objective 1	Protection of school children and staff
Goal 3	**Improve coordination, communication, and response operations with other relevant organizations**
Objective 1	Provide education and training
Objective 2	Improve first responder resources and capabilities
Goal 4	**Improve public communication, education, and awareness of hazards and their risks to the Exira-EHK Community School District**
Objective 1	Provide education and training

Table B.19: Exira EHK Community Schools Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Backup generator at 5-12 school	Infrastructure Failure, Extreme Heat, Severe Winter Storm	Medium	Superintendent, School Board, Maintenance Position	Moderate	School Funds, FEMA HMGP, Local Foundations	Emergency Services	Mid
Build a safe room at both schools	Infrastructure Failure, Tornado, Windstorm	High	School Board, Superintendent, School District's Engineering Firm	High	School Funds, City Funds, FEMA HMGP, Local Foundations	Prevention	Short
Training on bus evacuation	Transportation Incident	High	Transportation Director, Bus Drivers	Low	School Funds, Training Grants	Emergency Services	Ongoing
Continue to train local volunteers as much as feasibly possible	Terrorism, Severe Winter Storm, Thunderstorm/Lightning/Hail, Tornado, Flash Flood, Windstorm, Transportation Incident	High	Exira-EHK School District	Minimal	School Funds, FEMA AFG & SAFER	Public Education and Awareness	Ongoing
Install GPS in all school buses	Transportation Incident	Low	Exira-EHK School District	Moderate	School Funds, Iowa Department of Education	Emergency Services	Mid
Continued practice of drills and safety procedures with children at school	Tornado, Infrastructure Failure, Terrorism	High	Exira-EHK School District	Low	City Funds, School Funds	Public Education and Awareness	Ongoing
Create an emergency operations plan with an infections disease section	Human Disease	High	Exira-EHK School District Audubon County Public Health	Minimal	School Funds	Prevention	Short

Incorporation into Other Planning Mechanisms

Where possible, Exira will consider the findings from this document when updating or creating new planning and operating documents. Information from this plan will be utilized to update and expand the following documents:

- Hazard Mitigation Plan
- Comprehensive Plan
- Zoning Ordinance
- Floodplain Regulations
- Housing Needs Assessment

While the city currently does not have any of the plans listed below, if these plans were to be created during the life of this plan, this plan will be used to guide the development of:

- Water Conservation Plans
- Storm Water Management Plans
- Parks and Recreation Plans
- Building Code
- Strategic Plan

Incorporation in to Other Planning Mechanisms- Exira-EHK Community Schools

The update of the mitigation strategy will be provided to the School Superintendent for consideration in the next update cycle of the capital improvement plan. Information will be utilized to expand and improve the school's mitigation to potential hazard events.

Resolution Number 24.22 12.04.24

A RESOLUTION OF THE CITY OF EXIRA ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the City of Exira participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the City of Exira adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 4th DAY OF DECEMBER, 2024.

Mayor

ATTEST:

City Clerk

Resolution No. A2401

Resolution Adopting Multi-Jurisdictional Hazard Mitigation Plan

A RESOLUTION OF THE EXIRA-ELK HORN-KIMBALLTON COMMUNITY SCHOOL DISTRICT ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the Exira-Elk Horn-Kimballton Community School District participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the Exira-Elk Horn-Kimballton Community School Board adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 9th **DAY OF** December**, 2024.**

Chair

ATTEST:

Secretary

Appendix E: City of Gray

Community Profile

History

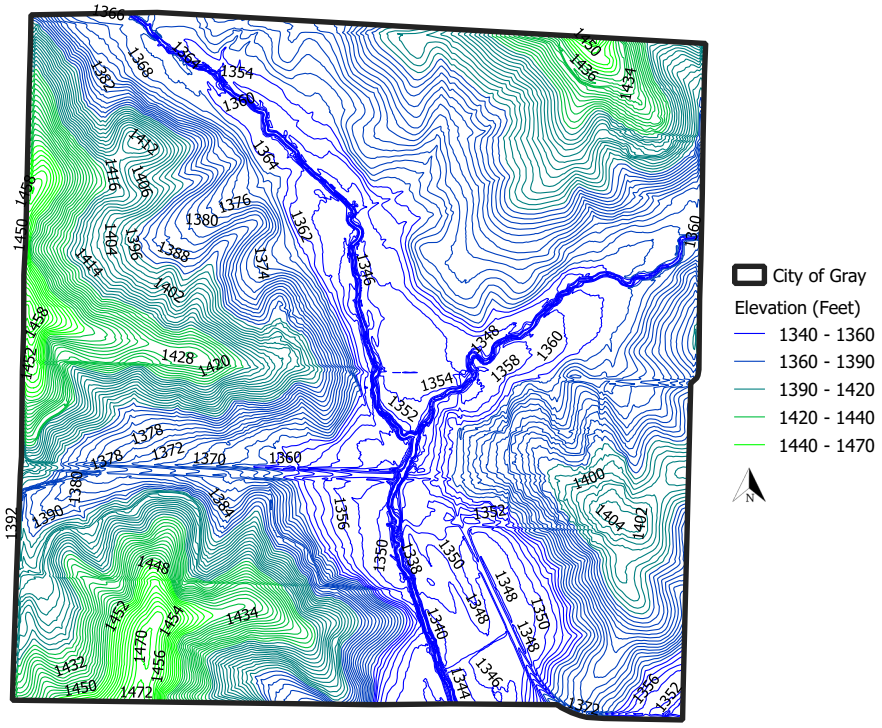
The City of Gray was founded in 1881 by George Gray who plotted the town on part of his 1,200 acres of farmland. Shortly after the city was founded, Gray erected a large steam elevator adjacent to the Chicago & Northwestern Railroad line which went through the area at the time. Without the influence of Gray, the railroad may not have traveled the path it did, as he donated the land that the railroad was originally constructed on.

Gray had population of over 150 and was home to many businesses by the turn of the century. In 1922, the city experienced a fire in the business district that destroyed all but one building on the north side of Main Street. Since that time, the City of Gray has experienced no growth. The last train went through the city in 1952, and the school district consolidated with Audubon School District in 1981, closing the school in town.

Geography and Environment

Gray is located in the northwestern corner of Audubon County on County Route F16. A large portion of the city's land is farmland. The highest elevation in Audubon County can be found in the northwestern corner of the county where the elevation can reach as high as 1,540 feet above sea-level. Gray is located near the highest point in the county and has a highest elevation of 1,470 feet above sea-level. The city's elevation only changes 130 feet from the highest point to the lowest point. Map E.1 shows Gray's elevation.

Map E.1: City of Gray Elevation



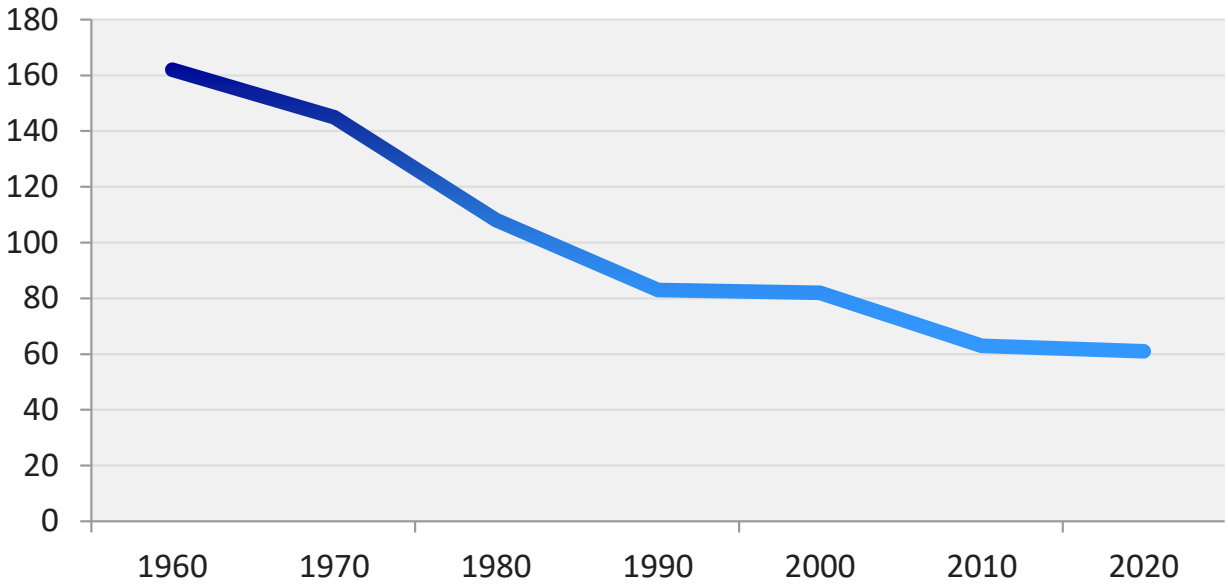
Demographics

The population of an area represents one of its most important assets. A population includes the labor force, entrepreneurs, taxpayers, and buyers of goods and services. This section will address several characteristics of Gray's population through past, present, and future trends of the region.

The size and composition of a community's population can exert influence on its development. For instance, population size, composition, and distribution influence the range of businesses a community can support, the pool of workers from which to draw, and the demand for and supply of services. Similarly, the effect people have on the social, economic, and physical environments depends upon the composition, expectations, and distribution of the population. A population's age distribution, income levels, ancestry, and educational attainment are some of the characteristics that mold a community. Population trends give community leaders and elected officials information on what kind of services need to be provided and offers prospective employers an overview of the local labor force.

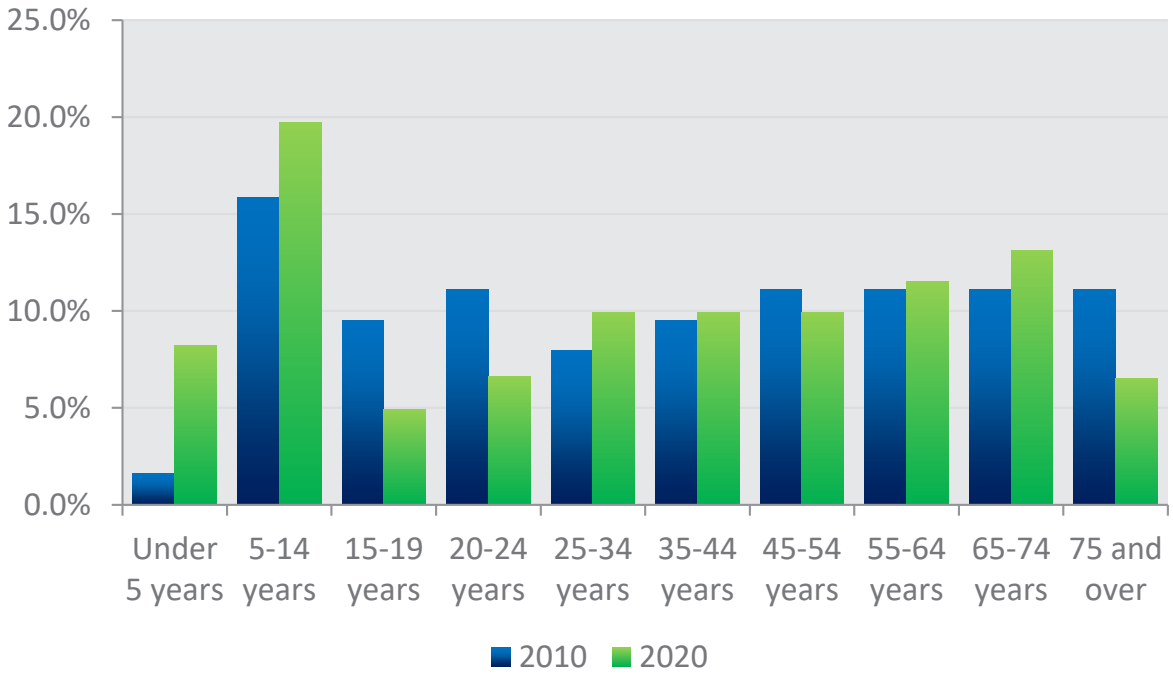
Since 1960, Gray's population has been in a slow decline. In 1960, the population of the city was 162 residents. Today, the city is home to 61 residents, a loss of 62.3% of the population in 60 years. From 1970 to 1980, the city experienced a loss of 37 residents, the largest decrease in population in 10 years. From 1990 to 2000, the city only lost one resident, the smallest decrease it has experienced within the period shown. Figure E.1 shows the city's historical population trend since 1960.

Figure E.1: City of Gray Historical Population, 1960-2020



Gray's age distribution is a little different than other parts of the county and state, but not extremely different. Most rural towns in Iowa experience spikes in the number of residents aged 55 and over. Gray has a large percentage of residents aged 5-14 and a uniform distribution between the remaining age groups, with the exception of the 15-19, 20-24, and 75 and over cohorts, which present much lower percentages. The complete breakdown of the population by age can be found in figure E.2.

Figure E.2: City of Gray Age Distribution, 2010 & 2020



Housing

A community's ability to attract new residents is important. One of the most important aspects to attracting residents is housing. A community's housing stock, type of households, and housing availability and affordability are determining factors.

In 2010, the Census found that there were 43 total housing units within the City of Gray. Since this time, there has been little to no development within the city's residential sector. Since 2010, the City of Gray has lost 5 housing units (11.6% of its previous housing stock). Renter-occupied units decreased by 11, while owner-occupied units decreased by 2. During the same period, the number of vacant units increased by 8. Table E.1 shows the breakdown from 2010 and 2022.

Table E.1: City of Gray Housing Units, 2010 & 2022

	2010		2022	
	Number	**Percent**	**Number**	**Percent**
Occupied Housing Units	40	93.0%	27	71.1%
Owner Occupied	23	57.5%	21	77.8%
Renter Occupied	17	42.5%	6	22.2%
Vacant Housing Units	3	7.0%	11	28.9%
Total Housing Units	43	100.0%	38	100.0%

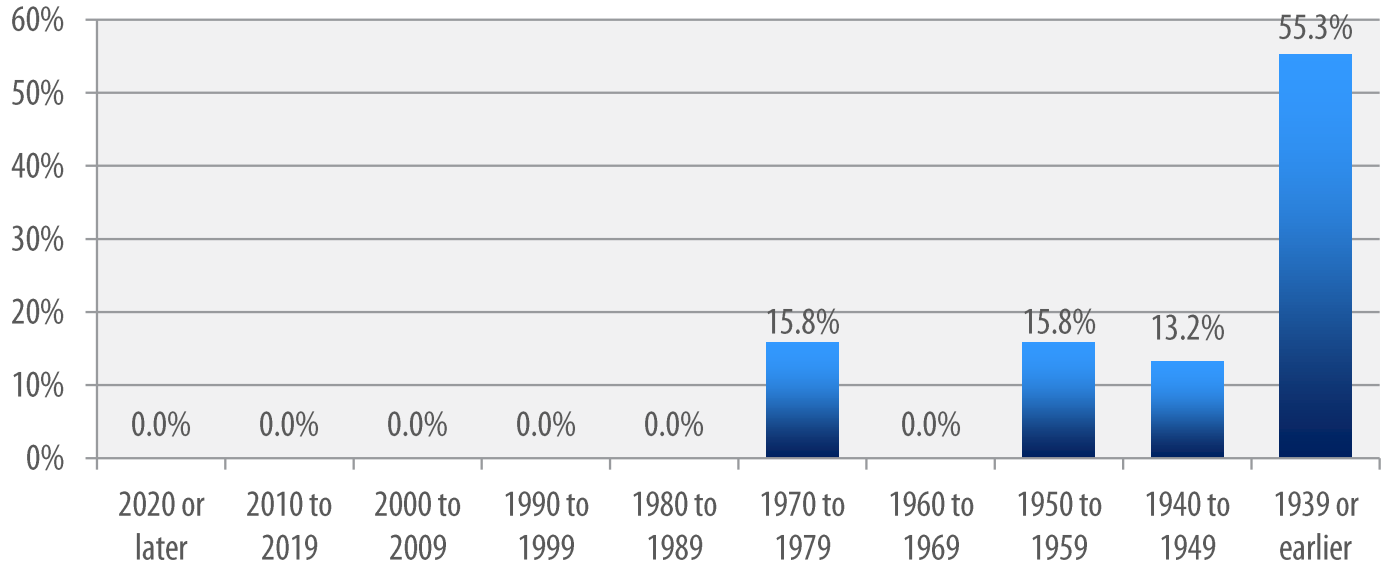
Gray, like many other rural Iowa towns, has a lower median housing value of $48,800. The State of Iowa has a median housing value of $162,200. The city's homes can be very affordable, and the community is located within driving distance to larger employment centers which can be used to attract new residents. However, these homes may deteriorate faster and will need a number of repairs and updates. According to the 2022 American Community Survey Estimates, 52.4% of the city's homes are valued less than $50,000. A complete breakdown of the value of homes in Brayton can be found in Table E.2.

Table E.2: City of Gray Value of Owner-Occupied Units, 2022

Value of Housing Unit	Percent of Homes
Less than $50,000	37.5%
$50,000 to $99,999	57.5%
$100,000 to $149,999	0.0%
$150,000 to $199,999	5.0%
$200,000 to $299,999	0.0%
$300,000 to $499,999	0.0%
$500,000 to $999,999	0.0%
$1,000,000 or more	0.0%

Figure E.3 showcases the year housing units within the City of Gray were constructed. Like most of the county, Gray has a large portion (55.3%) of the homes constructed in 1939 or earlier. The 1940s, 1950s and 1970s were the only other periods in the city's past to experience housing construction, with a very limited number of homes being built during these decades. Building standards of today utilize the most recent construction materials and safety features, ensuring that the new residential structures are as safe as possible. This does not mean that older homes are more unsafe, just that they be more susceptible to hazard damages.

Figure E.3: City of Gray Year Housing Units Constructed, 2022



Economics

Household income is an important indicator of the economic base in Audubon County. In Gray, the median household income is $53,750, which would classify a large number of the households in Gray as "working" or "middle" class. This number may have risen since 2010, but the margin of error on the 2021 estimates is close to 35%, which means that careful consideration must be taken when analyzing the numbers. Table E.3 breaks down the city's households by income. The City of Gray's household income breakdown is similar to the other rural communities in the area, and the combination of more affordable housing with the current incomes generally provides residents with a decent quality of life. The largest cohort of households (36.0%) makes between $35,000 and $49,999. The next largest cohort represents 24.0% of the households and makes $50,000 to $74,999.

Table E.3: City of Gray Household Income, 2022

Income and Benefits (2022 Inflation-Adjusted Dollars)	Number of Households	Percent of Households
Less than $10,000	0	0.0%
$10,000 to $14,999	2	8.0%
$15,000 to $24,999	1	4.0%
$25,000 to $34,999	0	0.0%
$35,000 to $49,999	9	36.0%
$50,000 to $74,999	6	24.0%
$75,000 to $99,999	2	8.0%
$100,000 to $149,999	5	20.0%
$150,000 to $199,999	0	0.0%
$200,000 or more	0	0.0%
Median Household Income	$53,750	--
Mean Household Income	$63,760	--

Table E.4 breaks down the industries that the city's population works in. The agriculture, forestry, fishing and hunting, and mining industry employs the largest percentage of Gray residents, with 26.7% of the city's population employed in this industry. Retail trade, as well as professional, scientific, management, administrative and waste management services are the second largest cohort, with 20.0% of the population working in each of these industries.

Table E.4: City of Gray Employment by Industry, 2022

Industry	Number	Percent
Total civilian non-farm employment, 16 years and over	30	100.0%
Agriculture, Forestry, Fishing, Hunting, Mining	8	26.7%
Construction	1	3.3%
Manufacturing	1	3.3%
Wholesale Trade	0	0.0%
Retail Trade	6	20.0%
Transportation and warehousing and utilities	0	0.0%
Information	0	0.0%
Finance and insurance, and real estate and rental and leasing	0	0.0%
Professional, scientific, management, administrative, and waste management services	6	20.0%
Educational, health care, and social assistance	5	16.7%
Arts, entertainment, recreation, accommodation, and food services	3	10.0%
Other services, except public administration	0	0.0%
Public Administration	0	0.0%

Existing Documents & Capabilities

The current planning and regulatory documents along with the year they were last updated for the City of Gray can be found in Table E.5. The City of Gray does not have a large number of regulatory documents in place, but there is still guidance in place to ensure that the city's vulnerability to hazards is not increased. First and foremost, the previous hazard mitigation plan, as well as this document lays out specific strategies to help the city reduce the impact hazards have on the community and those who live in it. The City does have some floodplain that runs throughout the city, but it is not a large portion of the city. Even though the amount of land is minimal, the city has adopted floodplain regulations to help dictate what can be built and how it needs to be built, within the flood zone. The City's housing needs assessment helps the city understand the housing stock within the community and how susceptible it can be to hazards. This can help guide the city to look for mitigation actions to reduce impact on the structures within the community.

Creation of a comprehensive plan will allow the City of Gray to take inventory of the community and create disaster response steps based on the type of disaster or damage to the city's capabilities. The city does not own nor operate any utilities, but working with utility partners on training or civilian response to response to hazards could benefit the community and its residents. Gray's roads are maintained by Audubon County and therefore partnering with the county for capital improvement projects and a continuity of operations plan would have a beneficial impact to the community overall. There are no staff, outside a part-time clerk, for Gray, so the city council needs to partner with outside organizations to ensure that the city's best interests and needs are met in regards to upgrades.

Table E.5: City of Gray Existing Documents

Document	Yes/No	Year
Previous HMP	Yes	2019
Comprehensive Plan	No	-
Building Code	No	-
Zoning Ordinance	No	-
Strategic Plan	No	-
Housing Needs Assessment	Yes	1997
NFIP Participant	Yes	1977
Floodplain Regulations	Yes	2016

NFIP Participation

In the past, there have been instances of flooding within the city limits of Gray. Gray started participating in the NFIP in 1977, and the flood map was updated in 2016. The city's FIRMs can be found in the later in this appendix. The Mayor of Gray is the city's floodplain administrator. Any development/demolition in the floodplain is required to obtain a permit which regulates the development/demolition and lays out the NFIP regulations that must be followed. Gray participates in the NFIP and implements substantial improvement / substantial damage provisions in the following manner: Local officials (1) determine the cost of work, (2) determine the market value of buildings, (3) make SI/SD determinations and provide determinations to property owners, and (4) require owners to obtain permits to bring substantially improved and substantially damaged structures into compliance with the floodplain management requirements.

Outlook and Future Development

Since the last plan update, there has been no development or rehabilitation that has occurred in the City of Gray. There is no development planned for the next five years that this plan covers. The city's vulnerability will not change over the life of this plan.

Table E.6: City of Gray Essential Infrastructure and Services

Major Arterials	County Rd. F 16, US Highway 71 (2 miles east of town)	**Air Service**	Audubon County Airport
Water Service	WCIRWA	**Sewer Service**	Individual septic tanks
Electric Service	MidAmerican Energy	**Gas Service**	None
Sanitation/Solid Waste	Local Haulers	**Landfill**	Audubon County Transfer Station, Harrison County Landfill
Phone and Internet	Mediacom, Windstream, wireless	**Law Enforcement**	Audubon County Sheriff
Fire Service	Audubon Fire Department	**Ambulance Service**	Audubon Fire & Rescue

Essential Infrastructure and Services

Knowing what services and infrastructure serves the city can be beneficial in a time of disaster so the appropriate companies can be contacted in need of utility shutoff or updated transportation routes. The city's essential infrastructure and services can be found in table E.6.

Table E.7: City of Gray Critical Facilities

Number on Map	Name	Address	Type
1	City Hall	201 Main Street	Essential Facility
2	Kendle Oil	1st Street	HAZMAT
3	Storm Siren	West of 2nd Street and North of Main Street	Essential Facility
4	School (Shelter)	406 Main Street	Vulnerable Population
5	Methodist Church	309 Main Street	Vulnerable Population

Map E.2: City of Gray Critical Facilities

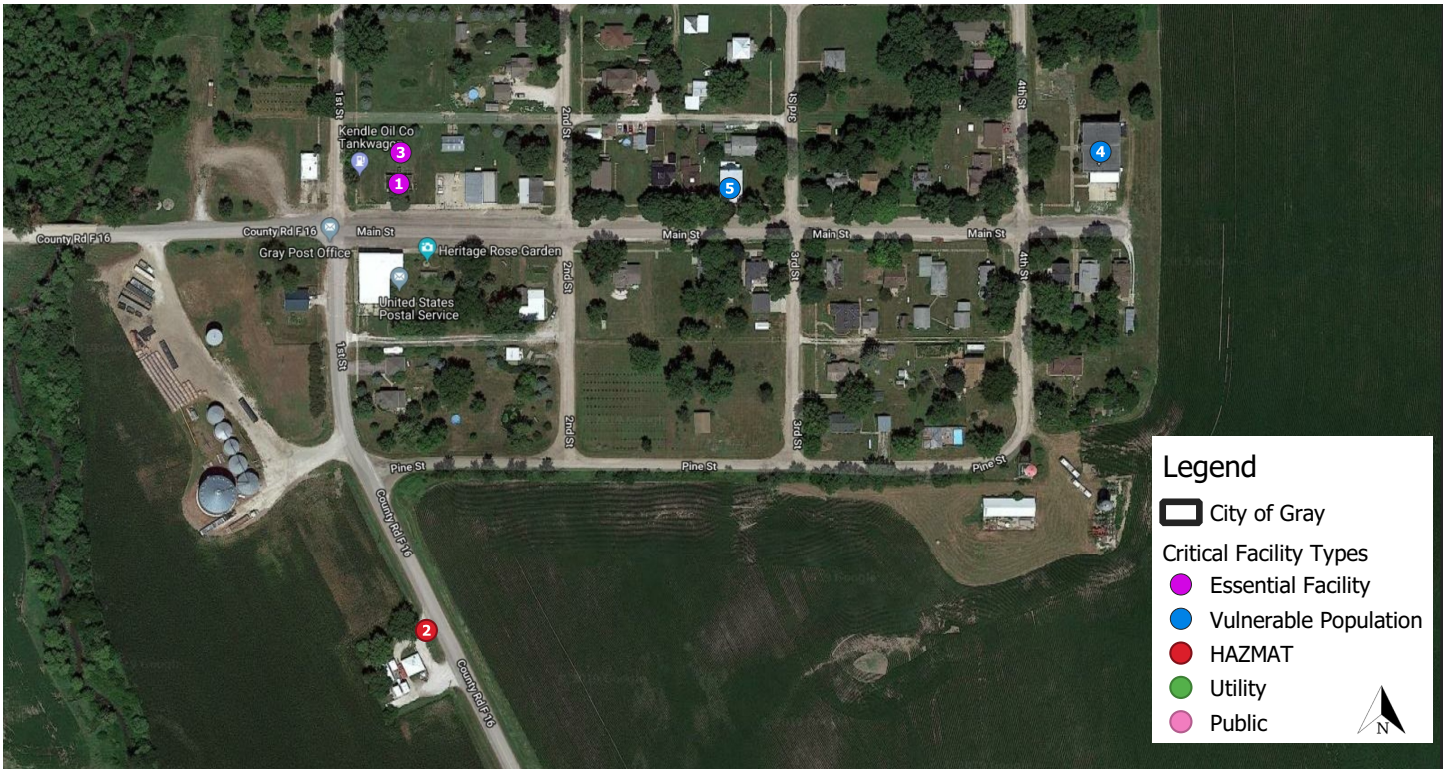


Table E.8: City of Gray Risk Assessment

Hazard	Comments
Animal/Plant/Crop Disease	The City of Gray contains a large amount of agricultural land. Although this land represents a large portion of the community, there have been minimal reported losses from animal/plant/crop disease within in the community. While this does impact the community, it is normally indirectly impacted.
Drought	Drought occurrences have increased across the state, and the City of Gray has not been exempt from this hazard. Droughts continue to increase in severity and while there is little warning, this hazard can cause both direct and indirect issues for the City and it's residents.
Earthquake	There have been no instances of earthquake in the City of Gray, and the committee feels there will be no instances during the life of this plan.
Expansive Soils	There have been no instances of expansive soils in the City of Gray, and the committee feels there will be no instances during the life of this plan.
Extreme Heat	Extreme heat events impact the City of Gray. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body.
Flash Flood	Since 2018, there have been no instances of flash flooding in the City of Gray. While flash floods have little to no warning time, with no instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the community for response to an event.
Grass/Wild Land Fire	Grass and wild land fires are most commonly field fires or controlled burns that get out of hand ion and immediately surrounding the city. This hazard can pose a large threat to the community as elements out of anyone's control, such as wind direction and speed, can change this hazard from harmless and controlled to out of control in a matter of minutes and can pose a threat to life.
HAZMAT Incident	Within the most recent planning period, there have been no instances of hazardous spills within the City of Gray. With no instances in five years, the committee feels this hazard is a minimal threat to the community and mitigation actions could be considered and implemented to prevent any instances.
Human Disease	Iowa and more specifically the City of Gray are still feeling the effects of the COVID-19 pandemic. The pandemic has reignited the need to plan for future outbreaks and examine the city's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.
Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the community to protect lives and property. The most likely infrastructure failure within Gray would be structural failure of either bridges or roadways. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.

Levee/Dam Failure	There are no levees or dams located in the City of Gray, and there are no high hazard dams on waterways that lead into the city. It is unlikely that levee or dam failure will impact the city, although the city feels that planning for river flooding and planning for dam/levee failure are similar in nature.
Radiological	During the previous planning period, there were no instances of Radiological Incident in Gray and the committee does not anticipate any happening in the next planning period. If an incident were to occur, the committee feels it would be a small, contained situation that would not threaten the community as a whole.
River Flooding	Within Gray, there is a portion of land located in the flood zone. While there is land in the flood zone, the land located in the flood zone is undeveloped. Since the last plan, there has been no reported flooding within the city. This hazard has a medium probability of effecting the community, and has historically not caused significant reportable damage within the community. Primary mitigation actions for this hazard would include limitations on construction in the flood zone.
Severe Winter Storm	Severe Winter Storms continue to impact the City of Gray. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within the city. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the community.
Terrorism	There have been no instances of terrorism in the City of Gray during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the community. While they are frequent, most storms pose no threat to life, crops, or property. This hazard is prevalent in Gray but is normally not severe in nature.
Tornado	Audubon County has experienced a number of tornadoes in the recent past, but these have not caused damage within the city. With the number of tornadoes that impact Audubon County growing, it is important for the city to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. Preparing the public and community is vital to ensuring there is no loss of life.
Transportation Incident	Speed limits within the City of Gray are low. With the community having lower speed limits, it is likely that any transportation incident between vehicles is likely to cause little damage to property or humans, but there is a chance of an incident which can cause extensive damage. The committee anticipates that this hazard will effect the community in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused reported damage to properties. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Gray prompting the community to prepare more effectively for these hazards.

Table E.9: City of Gray Maximum Building and Population Exposure

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	1	$1,148,600	58
Commercial	8	$67,560	
Industrial	0	$0	
Residential	39	$1,046,610	

It is unlikely that a jurisdiction can determine the impact any hazard will have. If a hazard were to impact the entire city, the numbers in table E.9 shows the number of people who would be affected and the maximum number of structures and their value. If this type of event were to occur, a shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability or even death.

The following hazards were determine to have a limited impact on the city, if they were to occur.

Earthquake
Expansive Soils
Grass/Wild Land Fire
Infrastructure Fire
Severe Winter Storm
Thunderstorm/Lightning/Hail
Transportation Incident
Windstorm

If a hazard were to report limited impacts, it is anticipated that the numbers impacted would be similar to table E.10. A shutdown of some facilities and services could last more than a week and any injuries/illnesses would not result in permanent disability. It is estimated that 25% of the city would be impacted.

Table E.10: City of Gray Limited Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	0	$103,374	5
Commercial	1	$6,080	
Industrial	0	$0	
Residential	4	$94,195	

The following hazards were determine to have a critical impact on the city, if they were to occur.

Animal/Plant/Crop Disease
Drought
Extreme Heat
Flash Flood
HAZMAT Incident
Human Disease
Levee/Dam Failure
Radiological
River Flooding
Terrorism
Tornado

If a hazard were to report critical impacts, it is anticipated that the numbers impacted would be similar to table E.11. A shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability. It is estimated 50% of the city would be impacted.

Table E.11: City of Gray Critical Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	0	$287,150	15
Commercial	2	$16,890	
Industrial	0	$0	
Residential	10	$261,653	

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

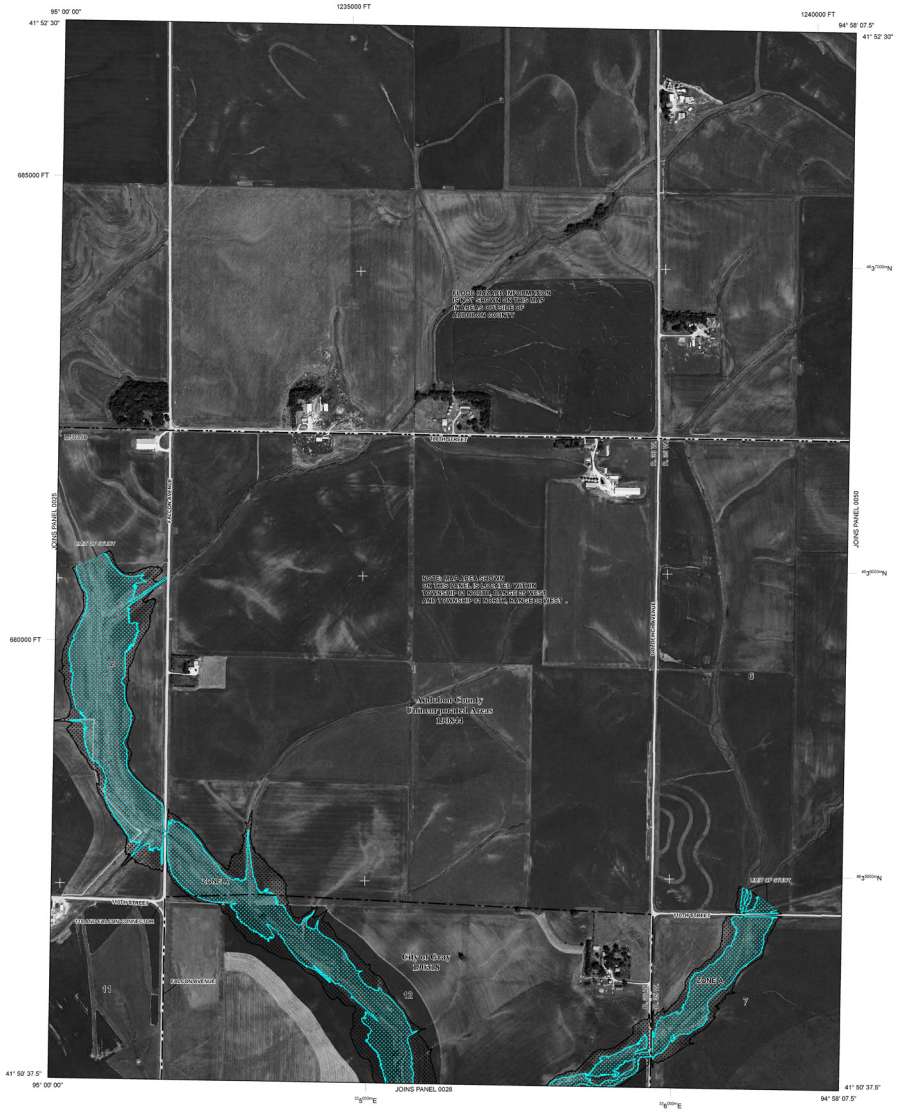
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 40° 02' 08", 95° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3160000 FT — 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- 5000 N — 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

NORTH

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP — NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0026D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 26 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190944	0026	D
GRAY, CITY OF	190019	0026	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0026D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

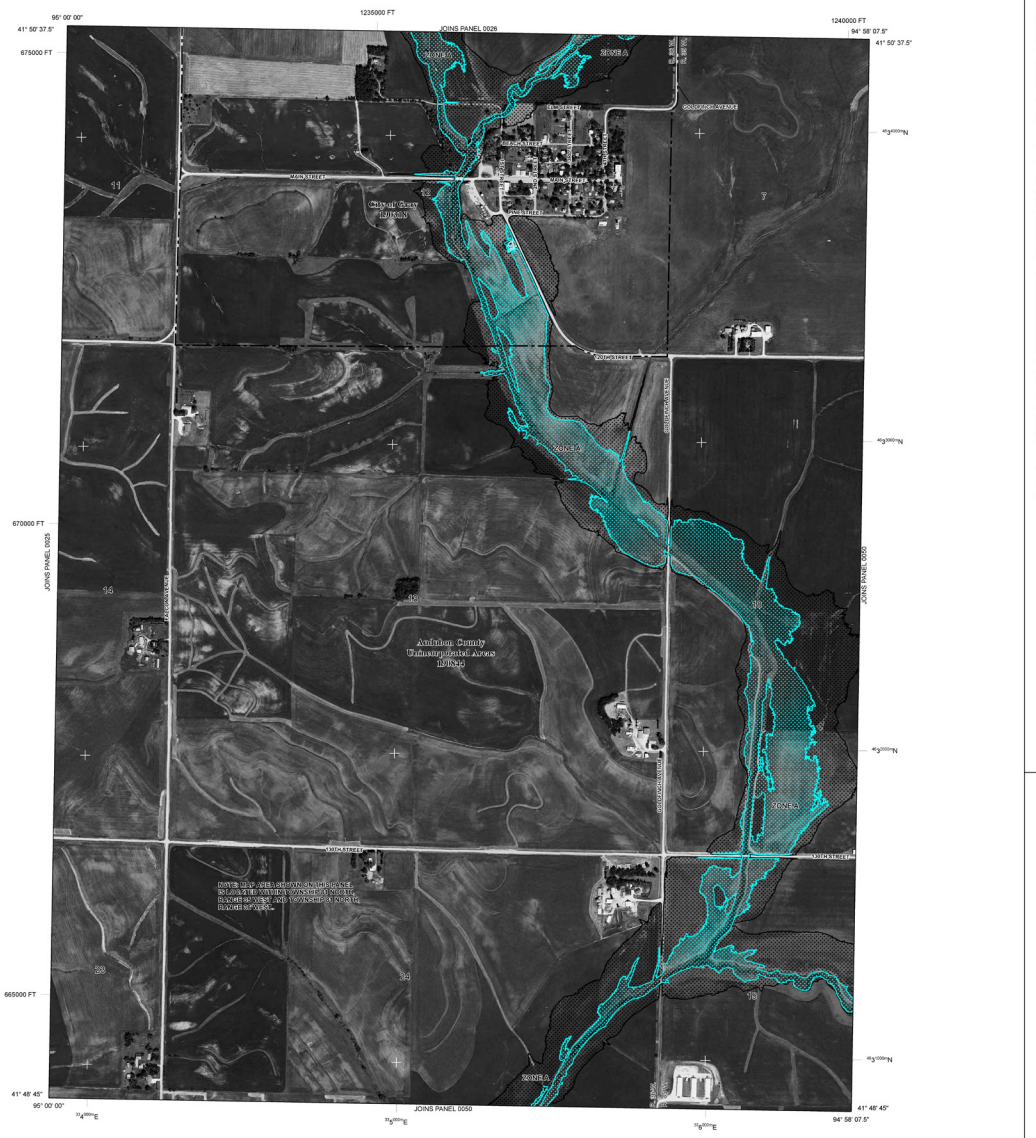
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A Cross section line

23 — 23 Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

3100000 FT 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection

4490000 N 1000-meter Universal Transverse Mercator grid values, zone 15

DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0028D

FIRM

FLOOD INSURANCE RATE MAP

AUDUBON COUNTY, IOWA AND INCORPORATED AREAS

PANEL 28 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0028	D
GRAY, CITY OF	190316	0028	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0028D
EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

Table E.12: City of Gray Status of Previous Mitigation Actions

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Continue contract with Audubon County Sheriff's Department to regularly patrol the community			X		
Continue franchise agreement with West Central Iowa Rural Water Association			X		
Establish supply for hazards if needed					X
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance			X		
Work with County Public Health or State DPH in the event of a disease outbreak			X		
Provide residents with NOAA weather radios			X		
Purchase emergency alert systems				X	
Inform residents of shelter location	X				
Keep residents informed of hazards for early warnings				X	
Update flood plain ordinance				X	
Evaluate current communications equipment and plan for future upgrades			X		
Purchase backup generators				X	
Purchase a generator for the shelter				X	
Inform residents of hazardous areas, keep residents informed of hazardous materials			X		

Action Plan

Section 201.6 (c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table E.13: City of Gray Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other community assets from the effects of hazards**
Objective 1	Keep residents aware of weather
Objective 2	Improve emergency alert systems
Objective 3	Limit damage in flood plain
Goal 2	**Minimize to the greatest possible extent the vulnerability of the people of Audubon County to the impacts of all identified hazards**
Objective 1	Monitor drought conditions
Objective 2	Protect health and safety
Goal 3	**Improve public communication, education, and awareness of hazards and their risks in Audubon County**
Objective 1	Provide education to increase public awareness

Table E.14: City of Gray Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Continue contract with Audubon County Sheriff's Department to regularly patrol the community	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	City Council, County	Minimal	City Funds, Audubon County	Emergency Services	Ongoing
Continue franchise agreement with West Central Iowa Rural Water Association	Infrastructure Failure	Medium	City Council	Low	City Funds, WCIRWA	Emergency Services	Ongoing
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance	River Flooding	Medium	City Council	Moderate	City Funds	Prevention	Ongoing
Work with County Public Health or State DPH in the event of a disease outbreak	Human Disease	Medium	City Council	Low	City Funds, State Assistance	Emergency Services	Ongoing
Provide residents with NOAA weather radios	Tornado, Thunderstorm/ Lightning/Hail, Extreme Heat, Severe Winter Storms	Medium	City Council	Minimal	City Funds	Emergency Services	Ongoing
Purchase emergency alert systems	Tornado, Thunderstorm/ Lightning/Hail, Extreme Heat, Severe Winter Storms	Medium	City Council	Low	City Funds	Emergency Services	Ongoing
Inform residents of shelter location	Tornado, Extreme Heat, Severe Winter Storm	Medium	City Council	Low	City Funds	Emergency Services	Ongoing

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Keep residents informed of hazards for early warnings	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	City Council	Moderate	City Funds	Emergency Services	Long
Update flood plain ordinance	River Flooding	Low	City Council	Minimal	City Funds	Prevention	Short
Evaluate current communications equipment and plan for future upgrades	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/ Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	City Council	Low	City Funds	Emergency Services	Ongoing
Purchase backup generators	Infrastructure Failure	Low	City Council	Low	City Funds, FEMA HMGP with State Cost Share, Local Foundations, Iowa Energy GRID Grant/ RLF	Emergency Services	Long

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Purchase a generator for the shelter	Infrastructure Failure, Tornado, Windstorm, Severe Winter Storm, Extreme Heat, Thunderstorm/Lightning/Hail	Medium	City Council	Low	City Funds, FEMA HMGP, Local Foundations, Donations	Emergency Services	Mid
Inform residents of hazardous areas, keep residents informed of hazardous materials	HAZMAT Incident	High	Emergency Services/ City Council	Moderate	City Funds	Public Education and Awareness	Long
Have storm siren examined to determine if purchasing new is required or if siren can just be updated/upgraded	Infrastructure Failure, Tornado, Windstorm, Severe Winter Storm, Thunderstorm/ Lightning/Hail	High	Emergency Services/ City Council	Low	City Funds, County Emergency Services, Local Foundations, USDA Community Facilities, FEMA HMGP	Emergency Services	Short
Develop and practice evacuation plans citywide	Flash Flood, Grass/Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Terrorism, Transportation Incident	High	City Council, Fire Department	Minimal	City Funds	Prevention	Short
Explore City obtaining it's own water supply as a back-up	Drought, Infrastructure Failure, Terrorism	High	City Council, Engineering Firm	High	City Funds, Community Development Block Grant, USDA, SRF, Local Foundations	Structural Project	Long

Incorporation into Other Planning Mechanisms

Where possible, Gray will consider the findings from this document when updating or creating new planning and operating documents. Information from this plan will be utilized to update the following documents:

- Hazard Mitigation Plan
- Floodplain Regulations
- Housing Needs Assessment

While the city currently does not have any of the plans listed below, if these plans were to be created during the life of this plan, this plan will be used to guide the development of:

- Water Conservation Plans
- Storm Water Management Plans
- Parks and Recreation Plans
- Building Code
- Strategic Plan
- Comprehensive Plan
- Zoning Ordinance

Resolution No. 2024-8

Resolution Adopting Multi-Jurisdictional Hazard Mitigation Plan

A RESOLUTION OF THE CITY OF GRAY ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the City of Gray participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the City of Gray adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 9th **DAY OF** December **, 2024.**

Alecia Bluml
Mayor

ATTEST:

Cheryl Tile
City Clerk

Appendix F: City of Kimballton

Community Profile

History

Kimballton was the last community platted in Audubon County. In 1882, Hans J. Jorgensen journeyed from the southeastern part of the county to the western part following some settled trails. He settled in what is the southwest corner of the county, and more people, almost exclusively Danes, followed from both Audubon and Shelby Counties in 1883.

The town was named for an official railroad, Edward Kimball. With the coming of the Atlantic Northern Railway, businesses and banks were established and many new residences were built. The railroad has since been discontinued, but nothing has yet stopped the Danish people in Kimballton.

Geography and Environment

Kimballton is located in far southwest Audubon County at the intersection of Iowa Highways 44 and 173. Kimballton is located 15 miles south and west of Audubon and is approximately 18 miles north of Atlantic. The city's topography is rolling as the community is constructed on a hillside. The highest elevation in Audubon County can be found in the northwestern corner of the county where the elevation can reach as high as 1,540 feet above sea-level. Kimballton ihas a highest elevation of 1,400 feet above sea-level. The city's elevation changes 168 feet from the highest point to the lowest point. Map F.1 shows Kimballton's elevation.

Demographics

The population of an area represents one of its most important assets. A population includes the labor force, entrepreneurs, taxpayers, and buyers of goods and services. This section will address several characteristics of Kimballton's population through past, present, and future trends of the region.

The size and composition of a community's population can exert influence on its development. For instance, population size, composition, and distribution influence the range of businesses a community can support, the pool of workers from which to draw, and the demand for and supply of services. Similarly, the effect people have on the social, economic, and physical environments depends upon the composition, expectations, and distribution of the population. A population's age distribution, income levels, ancestry, and educational attainment are some of the characteristics that mold a community. Population trends give community leaders and elected officials information on what kind of services need to be provided and offers prospective employers an overview of the local labor force.

Since 1960, Kimballton's population has been fluctuating with a declining trend. In 1960, the population of the city was 380 residents. Today, the city is home to 291 residents. From 1980 to 1990, the city experienced a loss of 73 residents, the largest decrease in population shown in the figure. From 2010 to 2020, the city lost 31 residents. Figure F.1 shows the city's historical population trend since 1960.

Map F.1: City of Kimballton Elevation

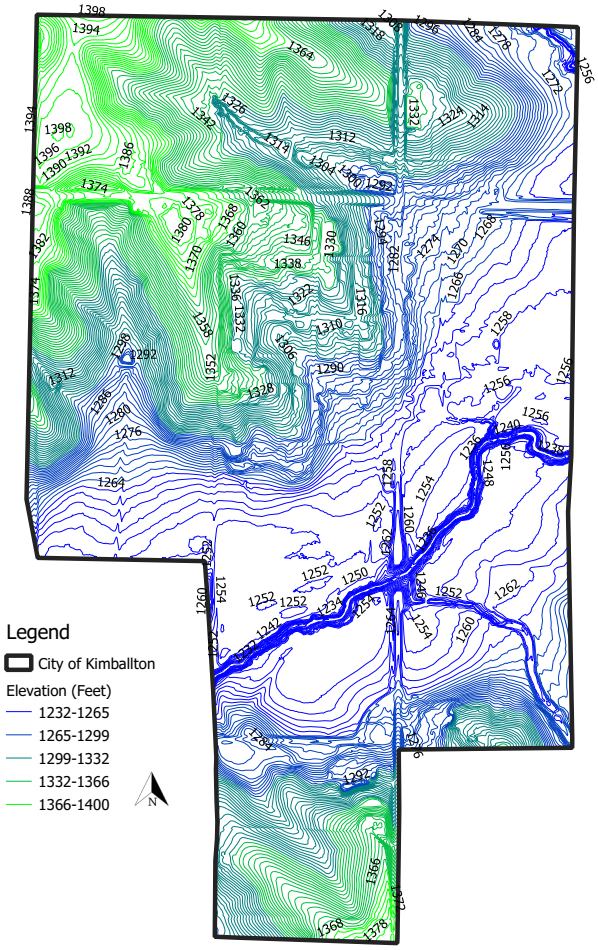
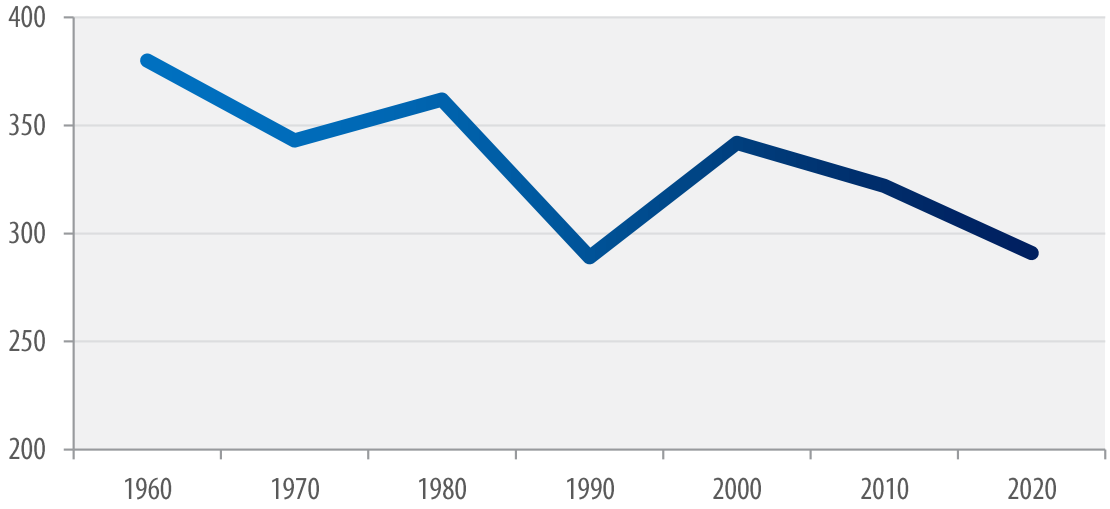
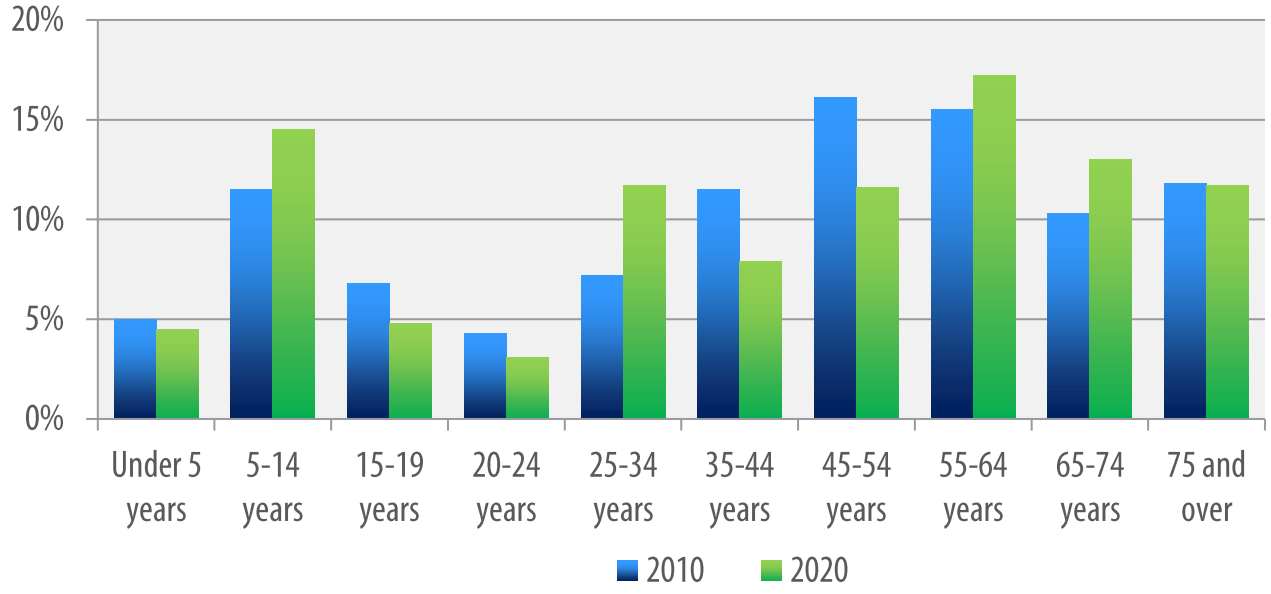


Figure F.1: City of Kimballton Historical Population, 1960-2020



Kimballton's population distribution is similar to most rural towns in Iowa, where spikes in the number of residents aged 55 and over are noticed. Since 2010, there have not been any large changes to the population's makeup. The most noticeable changes happened in the 25-34 and 45-54 age ranges. From 2010 to 2020, the 25-34 age range noticed a large increase in numbers while the 45-54 age range noticed a similar percentage decrease. A complete breakdown is found in figure F.2.

Figure F.2: City of Kimballton Age Distribution, 2010 & 2020



Housing

A community's ability to attract new residents is important. One of the most important aspects to attracting residents is housing. A community's housing stock, type of households, and housing availability and affordability are determining factors.

In 2010, the Census found that there were 155 total housing units within the City of Kimballton. Since this time, there has been little to no development within the city's residential sector. Since 2010, the City of Kimballton has lost 20 housing units (12.9% of its previous housing stock). Renter-occupied units decreased by 8, while owner-occupied units decreased by 19. During the same period, the number of vacant units increased by 7. Table F.1 shows the breakdown from 2010 and 2022.

Table F.1: City of Kimballton Housing Units, 2010 & 2022

	2010		2022	
	Number	**Percent**	**Number**	**Percent**
Occupied Housing Units	138	89.0%	111	82.2%
Owner Occupied	97	70.3%	78	70.3%
Renter Occupied	41	29.7%	33	29.7%
Vacant Housing Units	17	11.0%	24	17.8%
Total Housing Units	155	100.0%	135	100.0%

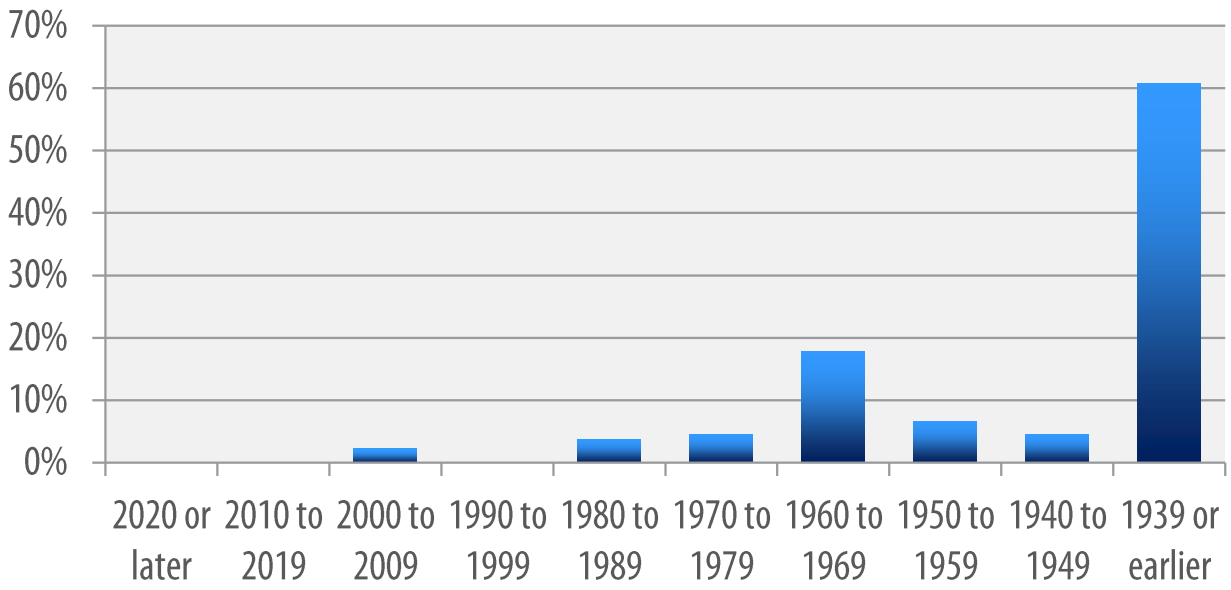
The City of Kimballton has 20.5% of the city's homes valued less than $50,000 and 47.4% valued from $50,000 to $99,999. These numbers help explain why Kimballton, like many other small rural towns in Iowa, has a lower median housing value of $80,000, which is $82,200 less than the State's median housing value of $162,200. Knowing information about the city's housing stock is useful after a disaster hits to determine how much damage was done, and how it will affect the city moving forward.

Table E.2: City of Kimballton Value of Owner-Occupied Units, 2022

Value of Housing Unit	Percent of Homes
Less than $50,000	20.5%
$50,000 to $99,999	47.4%
$100,000 to $149,999	14.1%
$150,000 to $199,999	11.7%
$200,000 to $299,999	5.1%
$300,000 to $499,999	1.3%
$500,000 to $999,999	0.0%
$1,000,000 or more	0.8%

According to the 2022 American Community Survey Estimates, 60.7% of the homes in Kimballton were constructed in 1939 or earlier. The estimates show that there have been no new builds since 2010. Figure F.3 shows a steady decrease in homes built from 1950 to 1989 and a considerably lower number of homes built from 1940 to 1949. A complete breakdown of the year homes in Exira were constructed can be found in figure D.3. Building standards of today utilize the most recent construction materials and safety features, ensuring that the new residential structures are as safe as possible. This does not mean that older homes are more unsafe, just that they may be more susceptible to hazard damage.

Figure F.3: City of Kimballton Year Housing Units Constructed, 2022



Economics

Household income is an important indicator of the economic base in Audubon County. In Kimballton, the median household income is $47,917, which would classify a large number of households in Kimballton as "working" or "middle" class. Table F.3 breaks down the city's households by income. The City of Kimballton's household income breakdown is similar to the other rural communities in the area, and the combination of more affordable housing with the current incomes generally provides residents with a decent quality of life. The largest cohort (16.2%) of Kimballton's residents makes between $100,000 and $149,999. The next largest cohort represents 15.3% of the population and makes $75,000 to $99,999.

Table F.3: City of Kimballton Household Income, 2022

Income and Benefits (2022 Inflation-Adjusted Dollars)	Number of Households	Percent of Households
Less than $10,000	14	12.6%
$10,000 to $14,999	16	14.4%
$15,000 to $24,999	11	9.9%
$25,000 to $34,999	6	5.4%
$35,000 to $49,999	11	9.9%
$50,000 to $74,999	14	12.6%
$75,000 to $99,999	17	15.3%
$100,000 to $149,999	18	16.2%
$150,000 to $199,999	4	3.6%
$200,000 or more	0	0.0%
Median Household Income	$47,917	--
Mean Household Income	$55,819	--

Kimballton, overall, is a small rural community in a small rural county. A large percentage of businesses within the county serves the largely agricultural economy. Table F.4 breaks down what industry Kimballton residents work in. The largest cohort of the population (23.8%) is employed in the educational, health care, and social assistance industry. Construction and retail trade are the second largest industries represented by workers in Kimballton, with 13.3% of the population working in these industries. The third largest are professional, scientific, management, administrative, and waste management services, as well as agriculture, forestry, fishing and hunting, and mining, with 9.5% of the city's population.

Table F.4: City of Kimballton Employment by Industry, 2022

Industry	Number	Percent
Total civilian non-farm employment, 16 years and over	105	100.0%
Agriculture, Forestry, Fishing, Hunting, Mining	10	9.5%
Construction	14	13.3%
Manufacturing	3	2.9%
Wholesale Trade	4	3.8%
Retail Trade	14	13.3%
Transportation and warehousing and utilities	6	5.7%
Information	1	1.0%
Finance and insurance, and real estate and rental and leasing	7	6.7%
Professional, scientific, management, administrative, and waste management services	10	9.5%
Educational, health care, and social assistance	25	23.8%
Arts, entertainment, recreation, accommodation, and food services	4	3.8%
Other services, except public administration	5	4.8%
Public Administration	2	1.9%

Existing Documents & Capabilities

The current planning and regulatory documents along with the year they were last updated for the City of Kimballton can be found in Table F.5. The documents help guide the city into the future and mitigate the effect hazards have on the city. First and foremost, the previous hazard mitigation plan, as well as this document lays out specific strategies to help the city reduce the impact hazards have on the community and those who live in it. The City's housing needs assessment helps the city understand the conditions of the housing stock and how potential hazards could impact the homes. Older homes, if not up kept, can be more likely to experience damage during less harmful events, which can lead the city to evaluate potential mitigation actions that with a newer housing stock may not be beneficial. The floodplain regulations are important as a portion of the community is in the flood zone. These regulations allow the city to say that only non-critical uses can be built within the flood zone. In the City of Kimballton's case, this involves the city's burn pile, and ballfields. It also allows the city to say if other uses are to be constructed that certain building standards must be followed to reduce the impact flooding could have on the structure.

Kimballton would benefit from the creation of plans to help understand the city's current needs and recognize it's vulnerabilities. First and foremost, a general survey of the community's utilities and infrastructure would allow for residents and staff to understand the current situation and what hazards would have the largest impact if they were to occur. From that survey, a capital improvement plan would allow the city to create a plan to react to the largest issues found first, and then move down the list in order of importance. This planning would allow the city to be more proactive, instead of reactive, like it currently is. Creating a plan also allows outside partners (example: COG) to assist with funding sources and lining up grant funds to lift some of the burden off the residents and city's finances. Engineers, also when brought in early, can help with funding opportunities. As Kimballton employs only one full-time staff member, it is important that that staff member is trained on all the different systems within the community and knows what to do in the face of a hazard. Also in those instances, it is vital that local volunteers are also versed in hazard response and in Kimballton's case, a continuity of operations plan would be extremely beneficial, so multiple individuals know how to react/ prepare for a hazard event.

Table F.5: City of Kimballton Existing Documents

Document	Yes/No	Year
Previous HMP	Yes	2019
Comprehensive Plan	No	-
Building Code	No	-
Zoning Ordinance	No	-
Strategic Plan	No	-
Housing Needs Assessment	Yes	1997
NFIP Participant	Yes	1986
Floodplain Regulations	Yes	2016

NFIP Participation

There have been instances of minimal flooding in Kimballton. The city started participating in the NFIP in 1986, and the flood maps were updated in 2016. The city's FIRMs can be found in the later in this appendix. The Mayor of Kimballton is the city's floodplain administrator. Any development/demolition in the floodplain is required to obtain a permit which regulates the development/demolition and lays out the NFIP regulations that must be followed. Kimballton participates in the NFIP and implements substantial improvement / substantial damage provisions in the following manner: Local officials (1) determine the cost of work, (2) determine the market value of buildings, (3) make SI/SD determinations and provide determinations to property owners, and (4) require owners to obtain permits to bring substantially improved and substantially damaged structures into compliance with the floodplain management requirements.

Outlook and Future Development

Since the last plan update, there has been limited development/redevelopment in Kimballton. There has been some conversion from commercial properties to residential on Main Street, and limited residential rehabilitation as well. Throughout the life of this plan, similar growth is expected with no major development planned. While the city is not anticipated to see any major development over the planning period, their vulnerability to hazards is anticipated to increase due to the increasing age of the city's utility and transportation infrastructure.

Table F.6: City of Kimballton Essential Infrastructure and Services

Major Arterials	Iowa Highway 44 & Iowa Highway 173	**Air Service**	Audubon County Airport
Water Service	City of Kimballton	**Sewer Service**	Municipal
Electric Service	Kimballton Municipal	**Gas Service**	MidAmerican Energy
Sanitation/Solid Waste	Local Haulers	**Landfill**	Audubon County Transfer Station, Harrison County Landfill
Phone and Internet	Marne Elk Horn Telephone Co., wireless	**Law Enforcement**	Audubon County Sheriff
Fire Service	Kimballton City Fire Department	**Ambulance Service**	Elk Horn Rescue

Essential Infrastructure and Services

Knowing what services and infrastructure serves the city can be beneficial in a time of disaster so the appropriate companies can be contacted in need of utility shutoff or updated transportation routes. The city's essential infrastructure and services can be found in table F.6.

Table F.7: City of Kimballton Critical Facilities

Number on Map	Name	Address	Type
1	City Clerk's Office	116 N Main Street	Essential Facility
2	Fire Department	204 E 1st Street	Essential Facility
3	Immanuel Lutheran Church	204 W 2nd Street	Vulnerable Population
4	Storm Siren	South of IA 44	Essential Facility
5	Storm Siren	North of Alfred Street and West of W 1st Street	Essential Facility
6	Water Tower	SW of View Street	Utility
7	Wellhead	East Side of Town	Utility
8	City Light Plant	203 E 1st Street	Utility
9	Kimballton Substation	E 1st Street	Utility

Map F.2: City of Kimballton Critical Facilities

Table F.8: City of Kimballton Risk Assessment

Hazard	Comments
Animal/Plant/Crop Disease	The City of Kimballton contains a sizeable amount of agricultural land. Although this land represents a portion of the community, there have been minimal reported losses from animal/plant/crop disease within in the community. While this does impact the community, it is normally indirectly impacted.
Drought	Drought occurrences have increased across the state, and the City of Kimballton has not been exempt from this hazard. Droughts continue to increase in severity and while there is little warning, this hazard can cause both direct and indirect issues for the City and it's residents.
Earthquake	There have been no instances of earthquake in the City of Kimballton, and the committee feels there will be no instances during the life of this plan.
Expansive Soils	There have been no instances of expansive soils in the City of Kimballton, and the committee feels there will be no instances during the life of this plan.
Extreme Heat	Extreme heat events impact the City of Kimballton. Education may be one of the best action tools to combat the effects of extreme heat as individuals need to know the effects of extreme heat and how it can affect the body.
Flash Flood	Since 2018, there have been no instances of flash flooding in the City of Kimballton. While flash floods have little to no warning time, with no instances within the last planning period, the committee has determined this hazard is not a high priority hazard to address, but will consider mitigation actions to prepare the community for response to an event.
Grass/Wild Land Fire	Grass and wild land fires are most commonly field fires or controlled burns that get out of hand ion and immediately surrounding the city. This hazard can pose a large threat to the community as elements out of anyone's control, such as wind direction and speed, can change this hazard from harmless and controlled to out of control in a matter of minutes and can pose a threat to life.
HAZMAT Incident	Within the most recent planning period, there have been no instances of hazardous spills within the City of Kimballton. With no instances in five years, the committee feels this hazard is a minimal threat to the community and mitigation actions could be considered and implemented to prevent any instances.
Human Disease	Iowa and more specifically the City of Kimballton are still feeling the effects of the COVID-19 pandemic. The pandemic has reignited the need to plan for future outbreaks and examine the city's current practices. The pandemic also reminded the public the importance of staying informed and staying vigilant to protect themselves.

Infrastructure Failure	Infrastructure failures occur with little to no warning and can cause major disruptions within the community. Planning to respond to this hazard is important to the community to protect lives and property. The most likely infrastructure failure within Kimballton would be structural failure of either bridges or roadways. As these instances have no warning time, planning must be completed prior to an event happening to be able to respond in a quick manner.
Levee/Dam Failure	There are no levees or dams located in the City of Kimballton, and there are no high hazard dams on waterways that lead into the city. It is unlikely that levee or dam failure will impact the city, although the city feels that planning for river flooding and planning for dam/levee failure are similar in nature.
Radiological	During the previous planning period, there were no instances of Radiological Incident in Kimballton and the committee does not anticipate any happening in the next planning period. If an incident were to occur, the committee feels it would be a small, contained situation that would not threaten the community as a whole.
River Flooding	Within Kimballton, there is a portion of land located in the flood zone. While there is land in the flood zone, the land located in the flood zone is undeveloped. Since the last plan, there has been no reported flooding within the city. This hazard has a medium probability of effecting the community, and has historically not caused significant reportable damage within the community. Primary mitigation actions for this hazard would include limitations on construction in the flood zone.
Severe Winter Storm	Severe Winter Storms continue to impact the City of Kimballton. These storms while historically, have caused little damage, continue to build in strength, threatening property and lives within the city. The warning period of this hazard continues to grow with meteorological advances, but can still pose great risks to the community.
Terrorism	There have been no instances of terrorism in the City of Kimballton during the previous plan period and the committee feels there will be no instances during the life of this plan. If an instance were to occur, the committee feels it would be a targeted incident that would not threaten the entire community.
Thunderstorm/ Lightning/Hail	Thunderstorm/lightning/hail instances are frequent within the community. While they are frequent, most storms pose no threat to life, crops, or property. This hazard is prevalent in Kimballton but is normally not severe in nature.
Tornado	Audubon County has experienced a number of tornadoes in the recent past, but these have not caused damage within the city. With the number of tornadoes that impact Audubon County growing, it is important for the city to continue to plan for the response to tornadoes as storms within Iowa continue to grow in strength. Preparing the public and community is vital to ensuring there is no loss of life.
Transportation Incident	Speed limits within the City of Kimballton are low. With the community having lower speed limits, it is likely that any transportation incident between vehicles is likely to cause little damage to property or humans, but there is a chance of an incident which can cause extensive damage. The committee anticipates that this hazard will effect the community in varying degrees throughout the planning period.
Windstorm	Recent windstorms have caused reported damage to properties. These hazard events continue to build in magnitude, causing increasingly large amounts of damage to property and posing threats to lives. The recent derechos effected Kimballton prompting the community to prepare more effectively for these hazards.

Table F.9: City of Kimballton Maximum Building and Population Exposure

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	6	$623,440	325
Commercial	25	$603,927	
Industrial	0	$0	
Residential	138	$6,940,622	

It is unlikely that a jurisdiction can determine the impact any hazard will have. If a hazard were to impact the entire city, the numbers in table F.9 shows the number of people who would be affected and the maximum number of structures and their value. If this type of event were to occur, a shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability or even death.

The following hazards were determine to have a negligible impact on the city, if they were to occur.

Dam/Levee Failure	Landslide	Radiological
Earthquake	River Flooding	Expansive Soils

If a hazard were to report negligible impacts, it is anticipated that the numbers impacted would be similar to table F.10. If there were any shutdown of facilities or services, it is likely that these shutdowns would be for less than twenty-four hours. If any injuries were to occur, it is anticipated that these would be able to be treated with first aid. A negligible hazard would impact approximately 9% of the city.

Table F.10: City of Kimballton Negligible Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	1	$56,110	29
Commercial	2	$54,353	
Industrial	0	$0	
Residential	12	$624,656	

The following hazards were determine to have a limited impact on the city, if they were to occur.

Thunderstorm/Lightning/Hail	Tornado
Windstorm	Grass/Wild Land Fire
Severe Winter Storms	Infrastructure Failure
Extreme Heat	HAZMAT Incident
Flash Flood	Transportation Incident

If a hazard were to report limited impacts, it is anticipated that the numbers impacted would be similar to table F.11. A shutdown of some facilities and services could last more than a week and any injuries/illnesses would not result in permanent disability. It is estimated that 25% of the city would be impacted.

Table F.11: City of Kimballton Limited Hazard Impacts

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	2	$155,860	81
Commercial	6	$150,982	
Industrial	0	$0	
Residential	35	$1,735,156	

The following hazards were determine to have a limited impact on the city, if they were to occur.

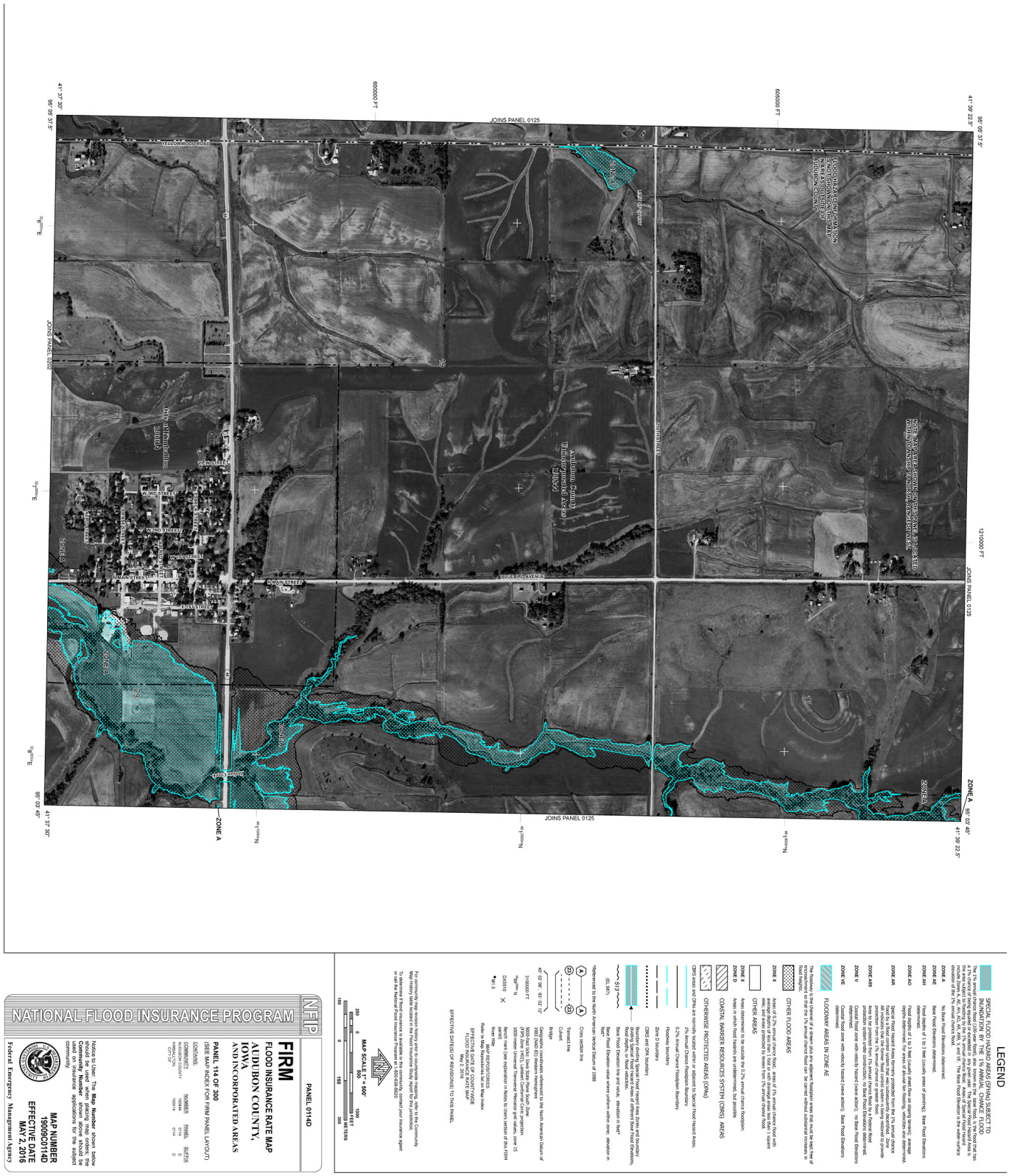
Drought
Animal/Plant/Crop Disease
Human Disease
Terrorism

If a hazard were to report critical impacts, it is anticipated that the numbers impacted would be similar to table F.12. A shutdown of some facilities and services could last for at least two weeks and some injuries/illnesses will result in permanent disability. It is estimated 50% of the city would be impacted.

Table F.12: City of Kimballton Critical Hazard Impact

Type of Structure	Number of Structures	Value of Structures	Number of People
Agricultural	3	$311,720	163
Commercial	13	$301,964	
Industrial	0	$0	
Residential	69	$3,470,311	

Flood Maps


LEGEND
SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD
The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% or greater chance of being equaled or exceeded in any given year. Special Flood Hazard Areas are subject to mandatory flood insurance purchase requirements. Zones include elevation of the 1% annual chance flood.
ZONE A
No Base Flood Elevations determined.
ZONE AE
Base Flood Elevations determined.
ZONE AH
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO
Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR
Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99
Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE
Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
OTHER FLOOD AREAS
ZONE X
Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
OTHER AREAS
ZONE X
Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D
Areas in which flood hazards are undetermined, but possible.
COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
1% Annual Chance Floodplain Boundary
0.2% Annual Chance Floodplain Boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
Base Flood Elevation line and value; elevation in feet*
(EL 987)
*Referenced to the North American Vertical Datum of 1988
Cross section line
Transect line
Culvert
Bridge
45° 02' 08", 93° 02' 12"
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
3100000 FT
5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
1000-foot grid values: Iowa State Plane South Zone
DX4510
Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5
River Mile
MAP REPOSITORIES
Refer to Map Repositories list on Map Index
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
May 2, 2016
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.
MAP SCALE 1" = 500'
500 0 1000 FEET
150 0 150 300 METERS
PANEL 0114D
FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA AND INCORPORATED AREAS
PANEL 114 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
AUDUBON COUNTY 190944 0114 D
CITY OF 190014 0114 D
NATIONAL FLOOD INSURANCE PROGRAM
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
19009C0114D
EFFECTIVE DATE
MAY 2, 2016
Federal Emergency Management Agency
JOINS PANEL 0122
JOINS PANEL 0125
JOINS PANEL 0125
JOINS PANEL 0125
YELLOWWOOD ROAD
E 18TH STREET
W 3RD STREET
W 2ND STREET
W 1ST STREET
MAIN STREET
EAST STREET
BLUEBIRD AVENUE
ZONE A
ZONE AE
ZONE X
City of Kimballton (UNINC)
Audubon County Unincorporated Areas (190009)
600000 FT
1210000 FT
41° 39' 22.5"
41° 37' 30"
95° 05' 37.5"
95° 03' 45"

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Iowa State Plane South Zone (FIPS zone 1402). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the U.S.D.A Farm Service Agency National Agriculture Imagery Program (NAIP) produced at a scale of 1:12,000 from photography dated 2010.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

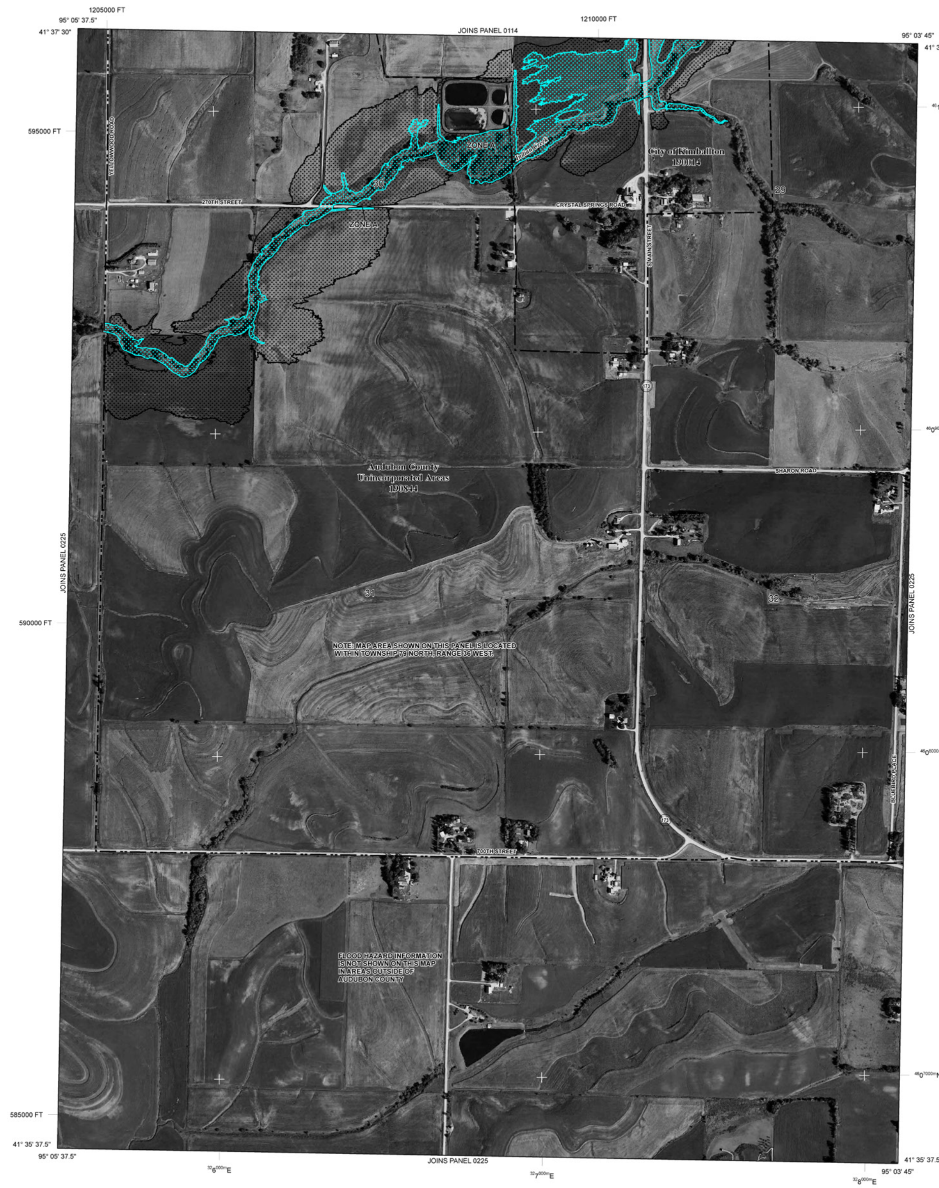
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

PANEL INDEX

PANEL NOT PRINTED



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A: Cross section line
- 23 - - - 23: Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12": Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT: 5000-foot ticks: Iowa State Plane South Zone (FIPS Zone 1402), Lambert Conformal Conic projection
- $^{49}89^{000m}$ N: 1000-meter Universal Transverse Mercator grid values, zone 15
- DX5510 ×: Bench mark (see explanation in Notes to Users section of this FIRM panel)
- • M1.5: River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 2, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP — NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0202D

FIRM
FLOOD INSURANCE RATE MAP
AUDUBON COUNTY, IOWA
AND INCORPORATED AREAS

PANEL 202 OF 300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUDUBON COUNTY	190844	0202	D
KIMBALLTON, CITY OF	190014	0202	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
19009C0202D

EFFECTIVE DATE
MAY 2, 2016

Federal Emergency Management Agency

Table F.13: City of Kimballton Status of Previous Mitigation Actions

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Install an additional radio repeater site for county fire and law enforcement frequencies	X				
Conduct inspections of city-owned assets to identify possible vulnerabilities					X
Initiate site-specific recovery/work around plans for critical facilities and infrastructure					X
Identify and evaluate potential shelter sites	X				
Select and designate official shelter site(s)	X				
Work with county and state emergency management for planning and post-event recovery actions		X			
Provide information to public officials regarding the steps necessary and the documentation requirements for applying for financial assistance in the wake of State and Federal Disaster Declarations					X
To the extent possible, pre-plan the after-incident actions for specific types of disasters		X			
Develop and implement agency specific, as well as interagency, training programs			X		
Bring public safety agencies together for mutual training programs			X		
Utilize emergency response personnel to assist in the distribution and education on the use of warning devices			X		
Replace warning siren at Fire Station	X				
Promote NOAA weather radios			X		
Work with engineer to determine most cost effective storage option to increase city's water storage capacity	X				
Replace generator				X	
Line up funding to replace electric capacity provided by existing electrical generator	Water - done			Electric - future	
Assist private owner of other facilities in the inspection process					X
Implement a mass public notification system on a county-wide basis and develop a county agency partnership to share the cost	X				

	Status				
Previous Actions	**Complete**	**Underway**	**Ongoing**	**Future**	**Not Implemented**
Develop a website that could be used, in part as a tool to push out public awareness information			X		
Go offline and buy additional electric capacity from outside the community (WAPA)	X				
Conduct a training drill for widespread disease outbreak	X				
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance			X		

Action Plan

Section 201.6 (c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Section 201.6 (c)(3)(iii): The mitigation strategy shall include an action plan, describing how the action 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 associated costs.

Section 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.

Table F.14: City of Kimballton Action Plan

Goal 1	**Minimize damage to critical facilities, infrastructure, and other community assets from the effects of hazards**
Objective 1	Work to ensure structural integrity of critical facilities and infrastructure assets
Objective 2	Put specific recovery plans in place for critical facilities
Goal 2	**Minimize to the greatest possible extent the vulnerability of the people of Audubon County to the impacts of all identified hazards**
Objective 1	Designate a community shelter
Objective 2	Put in place definitive action plans for identifiable hazards
Goal 3	**Improve coordination, communication, and response operations with other relevant organizations**
Objective 1	Create an open dialog with the public safety community
Objective 2	Improve county-wide communications capability
Objective 3	Develop the process for which disaster assistance can be applied
Objective 4	Enhance the area training environment
Goal 3	**Improve public communication, education, and awareness of hazards and their risks in Audubon County**
Objective 1	Work towards efficient and consistent delivery of public information
Objective 2	Promote the use of and provide access to weather warning devices

Table E.15: City of Kimballton Mitigation Actions

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Conduct inspections of city-owned assets to identify possible vulnerabilities	Infrastructure Failure, Terrorism	Medium	Public Works	Minimal	City General Fund, Utility Funds	Prevention	Mid
Initiate site-specific recovery/work around plans for critical facilities and infrastructure	Infrastructure Failure	Medium	County EMA	Minimal	City General Fund, Utility Funds, FEMA HMGP	Prevention	Mid
Identify and evaluate potential shelter sites	Tornado, Severe Winter Storms	Medium	City Council	Minimal	City General Funds	Prevention	Mid
Select and designate official shelter site(s)	Tornado, Severe Winter Storms	Medium	City Council	Minimal	City General Funds	Prevention	Mid
Work with county and state emergency management for planning and post-event recovery actions	Tornado, Severe Winter Storms, Windstorms	Medium	City Council	Minimal	City General Funds, Fire Department Funding, County EMA Funds, Audubon County	Emergency Services	Mid
Provide information to public officials regarding the steps necessary and the documentation requirements for applying for financial assistance in the wake of State and Federal Disaster Declarations	Tornado, Severe Winter Storms, Windstorms	High	County EMA	Minimal	City General Funds	Emergency Services	Mid
To the extent possible, pre-plan the after-incident actions for specific types of disasters	Tornado, Severe Winter Storms, Windstorms	Medium	County EMA	Minimal	City General Funds	Emergency Services	Mid

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Develop and implement agency specific, as well as interagency, training programs	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	Emergency Services	Minimal	Fire Department Funds, City General Funds, Other Department Funding, County EMA Funds, Audubon County	Emergency Services	Mid
Bring public safety agencies together for mutual training programs	Tornado, Severe Winter Storms, Windstorms, Infrastructure Failure, HAZMAT Incident, Transportation Incident, Radiological, Grass/Wild Land Fire	Medium	Emergency Services	Minimal	Fire Department Funds, City General Funds, Other Department Funding, County EMA Funds, Audubon County	Emergency Services	Mid
Utilize emergency response personnel to assist in the distribution and education on the use of warning devices	Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	Fire Department	Minimal	Local	Public Education and Awareness	Mid

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Promote NOAA weather radios	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	Fire Department	Minimal	City General Funds, Local Foundations	Public Education and Awareness	Mid
Replace generator	Tornado, Windstorm, Extreme Heat, Severe Winter Storms, Thunderstorm/Lightning/ Hail, Infrastructure Failure	Medium	City Council	Low	Citiy General Funds, City Utility Funds, FEMA HMGP, USDA Community Faciliites, FEMA AFG	Emergency Services	Mid
Line up funding to replace electric capacity provided by existing electrical generator	Extreme Heat, Severe Winter Storms, Tornado, Infrastructure Failure, Windstorm, Lightning/ Thunderstorm/Hail, Terrorism, Windstorm	Medium	City Council	Low	Electric Utili-ty Funds, City General Funds, FEMA HMGP, USDA Communi-ty Facilities, State Electric Loan, State Electric Grant	Emergency Services	Mid
Implement a mass public notification system on a county-wide basis and develop a county agency partnership to share the cost	Tornado, Severe Winter Storms, Windstorms	Medium	Emergency Services	Minimal	City Funds, Fire Department Funds, Audubon County, County EMA	Public Education and Awareness	Mid

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Develop a website that could be used, in part as a tool to push out public awareness information	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Medium	County EMA, City Council	Minimal	County EMA Funds, City General Funds, Local Foundations	Public Education and Awareness	Mid
Go offline and buy additional electric capacity from outside the community (WAPA)	Extreme Heat, Severe Winter Storms, Infrastructure Failure, Tornado, Windstorm	Medium	City Council	Minimal	City Electrical Funds	Emergency Services	Short
Conduct a training drill for widespread disease outbreak	Animal/Plant/Crop Disease, Human Disease	Medium	Public Health	Minimal	City General Funds, Audubon County Public Health	Prevention	Mid
Continue NFIP participation and follow NFIP policies by enforcing floodplain management ordinance	Flash Flood, River Flooding	Medium	City Council, County Emergency Management	Minimal	City General Funds	Prevention	Ongoing
Back-up generator for the city's electric utility	Infrastructure Failure, Tornado, Windstorm, Severe Winter Storm, Transportation Incident	High	City Council	High	City Utility Funds, State Electric Grants, State Electric Loan, Federal Electric Grants	Structural Project	Short

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Construct a new Electric Substation	Infrastructure Failure, Tornado, Windstorm, Severe Winter Storm, Transportation Incident	High	City Council	High	City Utility Funds, State Electric Grants, State Electric Loan, Federal Electric Grants	Structural Project	Short
Install new Electric Switch gears	Infrastructure Failure, Tornado, Windstorm, Severe Winter Storm, Transportation Incident	High	City Council	High	City Utility Funds, State Electric Grants, State Electric Loan, Federal Electric Grants	Structural Project	Short
Construct a new Transmission Line	Infrastructure Failure, Tornado, Windstorm, Severe Winter Storm, Transportation Incident	High	City Council	High	City Utility Funds, State Electric Grants, State Electric Loan, Federal Electric Grants	Structural Project	Short
Convert Electric to underground system	Infrastructure Failure, Tornado, Windstorm, Severe Winter Storm, Transportation Incident	High	City Council	High	City Utility Funds, State Electric Grants, State Electric Loan, Federal Electric Grants	Structural Project	Short
Upgrade storm sirens	Tornado, Windstorm, Severe Winter Storm Thunderstorm/Lightning/ Hail	High	City Council	Moderate	City General Funds, USDA Community Facilities Funds, Local Foundations, FEMA HMGP	Emergency Services	Mid

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Train & recruit additional volunteers	Animal/Plant/Crop Disease, Drought, Earthquake, Expansive Soils, Extreme Heat, Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Human Disease, Infrastructure Failure, Levee/Dam Failure, Radiological, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	City Council, Fire Department, Audubon County EMA	Minimal	City General Funds	Public Education and Awareness	Short
Purchase additional fire rescue tools to expand fire department's response ability	Flash Flood, Grass/ Wild Land Fire, HAZMAT Incident, Infrastructure Failure, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	High	Fire Department, City Hall	Minimal - Low	Fire Department Funds, City General Funds, Local Foundations, FEMA AFG	Emergency Services	Short
Purchase generator for fire department	Extreme Heat, Flash Flood, HAZMAT Incident, Human Disease, Infrastructure Failure, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Mod	Fire Department, City Council	Moderate	Fire Department Funds, City General Funds, Local Foundations, FEMA AFG, FEMA HMGP	Emergency Services	Short

Action	Hazard(s) Addressed	Priority	Responsible Department	Estimated Cost	Potential Funding Source(s)	Mitigation Measure Category	Target Completion Date
Purchase generator to operate sewer lift station	Extreme Heat, Flash Flood, HAZMAT Incident, Human Disease, Infrastructure Failure, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado, Transportation Incident, Windstorm	Mod	City Council	Moderate	City General Funds, Local Foundations, FEMA HMGP	Emergency Services	Short
Construct a new or retrofit a building to be a tornado shelter in/near city park	Tornado, Windstorm	Low	City Council	High	City General Funds, Local Foundations, FEMA HMGP	Structural Project	Long

Incorporation into Other Planning Mechanisms

Where possible, Kimballton will consider the findings from this document when updating or creating new planning and operating documents. Information from this plan will be utilized to update the following documents:

- Hazard Mitigation Plan
- Floodplain Regulations
- Housing Needs Assessment

While the city currently does not have any of the plans listed below, if these plans were to be created during the life of this plan, this plan will be used to guide the development of:

- Water Conservation Plans
- Storm Water Management Plans
- Parks and Recreation Plans
- Building Code
- Strategic Plan
- Comprehensive Plan
- Zoning Ordinance

Resolution No. 12.11.24

Resolution Adopting Multi-Jurisdictional Hazard Mitigation Plan

A RESOLUTION OF THE CITY OF KIMBALLTON ADOPTING THE AUDUBON COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2024

Whereas, The Board of Supervisors of Audubon County, IA has authorized the development of a multi-jurisdictional hazard mitigation plan; and,

Whereas, the City of Kimballton participated in the multi-jurisdictional hazard mitigation planning process; and

Whereas, the Audubon County Multi-Jurisdictional Hazard Mitigation Plan was prepared in compliance with the Hazard Mitigation Planning Requirement of the Disaster Mitigation Act of 2000 provided by the Iowa Homeland Security and Emergency Management Division.

NOW THEREFORE BE IT RESOLVED, that the City of Kimballton adopts the Audubon County Multi-Jurisdictional Hazard Mitigation Plan, incorporating citizen comments and recommendations.

PASSED AND ADOPTED THIS 11th DAY OF December, 2024.

Mayor

ATTEST:

City Clerk

Local Mitigation Plan Review Tool

Cover Page

The Local Mitigation Plan Review Tool (PRT) demonstrates how the local mitigation plan meets the regulation in 44 CFR § 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the local governments, including special districts.

1. The Multi-Jurisdictional Summary Sheet is a worksheet that is used to document how each jurisdiction met the requirements of the plan elements (Planning Process; Risk Assessment; Mitigation Strategy; Plan Maintenance; Plan Update; and Plan Adoption).
2. The Plan Review Checklist summarizes FEMA's evaluation of whether the plan has addressed all requirements.

For greater clarification of the elements in the Plan Review Checklist, please see Section 4 of this guide. Definitions of the terms and phrases used in the PRT can be found in Appendix E of this guide.

Plan Information	
Jurisdiction(s)	Audubon County
Title of Plan	Audubon County Multi-Jurisdictional Hazard Mitigation Plan 2025
New Plan or Update	Update
Single- or Multi-Jurisdiction	Multi-jurisdiction
Date of Plan	3/17/2025
Local Point of Contact	
Title	Lauren Mortensen, Economic Development Planner
Agency	Region XII Council of Governments
Address	1009 East Anthony Street PO Box 768 Carroll, IA 51401
Phone Number	712-792-9914
Email	lmortensen@region12cog.org

Additional Point of Contact	
Title	Chris Whitaker
Agency	Region XII Council of Governments
Address	1009 East Anthony Street PO Box 768 Carroll, IA 51401
Phone Number	712-792-9914
Email	cwhitaker@region12cog.org

Review Information	
State Review	
State Reviewer(s) and Title	Click or tap here to enter text.
State Review Date	Click or tap to enter a date.
FEMA Review	
FEMA Reviewer(s) and Title	Kari Snelding, Emergency Management Specialist
Date Received in FEMA Region	3/17/2025; 7/28/2025; 8/6/2025
Plan Not Approved	5/2/2025; 8/5/2025
Plan Approvable Pending Adoption	
Plan Approved	8/7/2025

Multi-Jurisdictional Summary Sheet

In the boxes for each element, mark if the element is met (Y) or not met (N).

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
1	Audubon County (Adopted: 12/3/2024)	Y	Y	Y	Y	Y	Y	N/A	N/A
2	City of Audubon (Adopted: 12/9/2025)	Y	Y	Y	Y	Y	Y	N/A	N/A
3	City of Brayton (Adopted: 12/10/2024)	Y	Y	Y	Y	Y	Y	N/A	N/A
4	City of Exira (Adopted: 12/4/2024)	Y	Y	Y	Y	Y	Y	N/A	N/A
5	City of Gray (Adopted: 12/09/2024)	Y	Y	Y	Y	Y	Y	N/A	N/A
6	City of Kimballton (Adopted: 12/11/2024)	Y	Y	Y	Y	Y	Y	N/A	N/A
7	Audubon Community Schools (Adopted: 12/16/2024)	Y	Y	Y	Y	Y	Y	N/A	N/A
8	Exira-EHK Community Schools (Adopted: 12/9/2024)	Y	Y	Y	Y	Y	Y	N/A	N/A

Plan Review Checklist

The Plan Review Checklist is completed by FEMA. States and local governments are encouraged, but not required, to use the PRT as a checklist to ensure all requirements have been met prior to submitting the plan for review and approval. The purpose of the checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been "met" or "not met." FEMA completes the "required revisions" summary at the bottom of each element to clearly explain the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is "not met." Sub-elements in each summary should be referenced using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each element and sub-element are described in detail in Section 4: Local Plan Requirements of this guide.

Plan updates must include information from the current planning process.

If some elements of the plan do not require an update, due to minimal or no changes between updates, the plan must document the reasons for that.

Multi-jurisdictional elements must cover information unique to all participating jurisdictions.

Element A: Planning Process

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))		
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan's development, as well as who was involved?	Chapter 1 Pages: 3-8	Met
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?	Chapter 1 Pages 4-7	Met

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A2. Does the plan document 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? (Requirement 44 CFR § 201.6(b)(2))		
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?	Chapter 1 Pages 4-7	Met
A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))		
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?	Chapter 1 Pages 4-7	Met
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))		
A4-a. Does the plan document what existing plans, studies, reports and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?	Chapter 1: Page 8 Chapter 3: Page 63	Met

ELEMENT A REQUIRED REVISIONS

Required Revision:

None.

Opportunity for Improvement:

A1a – While the Plan Appendix includes the jurisdiction's critical infrastructure, risk assessment, vulnerability and loss estimates, mitigation strategies, flood maps (when applicable), and resolution adopting the plan it is encouraged to also include other records such as copies of meeting minutes, sign-in sheets or newspaper articles in the Plan Appendix as a record of how decisions were made and who was involved. *Planners are encouraged to include additional supporting documentation in the next update of the plan.*

A2a – *Continue expanding on the list of stakeholders involved in addition to the Tables in Chapter 1 consider including a table that includes stakeholders given an opportunity to be involved in the planning process but were not able to participate.* From the Local Mitigation Policy Guide (LMPPG): 'Documenting the planning process is a crucial step for future plan updates. By building on the work that has already been done, the community can incorporate best practices and insights learned from previous processes while avoiding past challenges.' In the Tables in Chapter 1 consider including each stakeholder type using the identified groups in the LMPPG.

A3a – The plan identifies a gap that is worth considering in the next update of the plan. 'While the plan was made public through various postings on social media, links on websites, and a few newspaper postings, there were no comments received from the public about the plan or its contents.' *While there were multiple types of communication with the public it is encouraged to expand on opportunities for involvement in the planning process in the next update of the plan. Tailor communications and share through various platforms to reach the widest audience, different communities may necessitate more targeted outreach and engagement.* Having a variety of methods for community engagement allows for input from the whole community. From the LMPPG: This could 'help build widespread support for directing financial, technical and human resources toward natural hazard risk reduction.'

Strength:

A1a – The introduction gives a concise and clear overview of the participants in the planning process. The planning process narrative is detailed displaying involvement through meetings and events that were part of the plan's development.

A2a – Tables in Chapter 1 include the planning committee and additional plan contributors.

A4a – The plan included a variety of existing plans, studies, reports, and technical information.

Element B: Risk Assessment

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))		
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	Chapter 3 Table 3.2 Page 32 Omission of hazards: Chapter 3 Table 3.3 Page 32	Met
B1-b. Does the plan include information on the location of each identified hazard?	Chapter 3 Hazard Profiles Pages: 25- 64	Met
B1-c. Does the plan describe the extent for each identified hazard?	Chapter 3 Hazard Profiles Pages: 25- 64	Met
B1-d. Does the plan include the history of previous hazard events for each identified hazard?	Chapter 3 Hazard Profiles Pages: 25- 64	Met

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1-e. Does the plan include the probability of future events for each identified hazard, including the type, location and range of anticipated intensities?	Chapter 3 Hazard Profiles Pages: 25- 64	Met
B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?	Appendix A: 83-85 Appendix B: 124-125 139-140 Appendix C: 154-155 Appendix D: 175-176 187-188 Appendix E: 202-203 Appendix F: 222-223	Met
B2. Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))		
B2-a. Does the plan provide an overall summary of each jurisdiction's vulnerability to the identified hazards?	Appendix A: 83-85 Appendix B: 124-125 139-140 Appendix C: 154-155 Appendix D: 175-176 187-188 Appendix E: 202-203 Appendix F: 222-223	Met
B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?	Chapter 4: 66-67 Appendix A: 86 Appendix B: 126 Appendix C: 156 Appendix D: 177 Appendix E: 204 Appendix F: 224	Met
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?	Chapter 4 Page 66	Met

ELEMENT B REQUIRED REVISIONS

Required Revision:

None.

Opportunity for Improvement:

B1a –

- Each of the jurisdictional profiles identified expansive soils as little to no risk, especially during the upcoming the 5-year cycle of the plan 'There have been no instances of expansive soils, and the committee feels there will be no instances during the life of this plan.' *It is encouraged to expand on risk to expansive soils in the next update of the plan or consider omitting it from the risk assessment.*
- Each of the jurisdictional profiles identified Earthquake as little to no risk, especially during the upcoming the 5-year cycle of the plan 'There have been no instances of earthquake 'and the committee feels there will be no instances during the life of this plan.' *It is encouraged to expand on risk to Earthquake in the next update of the plan or consider omitting it from the risk assessment.*
- Some of the jurisdictional profiles indicated Levee/Dam Failure as little to no risk, but noted the planning was similar in nature to flooding. 'There are no levees or dams located in the city. It is unlikely that levee or dam failure will impact the city, although the city feels that planning for river flooding and planning for dam/levee failure are similar in nature.' *It is encouraged to expand on risk to Levee/Dam Failure in the next update of the plan or consider omitting it from the risk assessment.*

B1b –Some maps have low resolution making it difficult to read the map's text. *Consider including higher resolution images for the maps in the plan.* For map 3.2 consider including a location point for Audubon County; this could help provide sufficient detail and scale to clearly identify the hazard locations within and/or affecting assets owned by the participating jurisdiction(s).

B1c – Extent is most commonly expressed using various scientific scales. When describing extent using charts or scales (e.g., Saffir-Simpson scale for hurricane wind speed; Enhanced Fujita scale for tornado), the plan must document how the scale applies to each jurisdiction. The information must relate to each of the plan participants or the planning area, depending on the hazard.

- *Consider using the expansion index (EI) or another scale for expansive soils in the next update of the plan.*
- In the thunderstorms, lightning, and hail hazard profile there are multiple scales used. *Consider using either the NWS or the NCDC, not both.*

B1d – *Consider including a link to Iowa's Governor Disaster Proclamations.*

B1e –

- While earthquake probability is defined using historical frequency and a reference to a USGS seismic zone category in a map, it is encouraged to clearly define the general descriptor of low probability; with multiple definitions of probability, it is unclear which quantitative measure applies to the definition. Probability may be met in a variety of ways; however, general descriptors must be quantitatively defined*. It is encouraged to incorporate a table with general descriptors at the beginning of the risk assessment that have a standardized quantitative definition*. This allows for consistency of general descriptors across the identified hazards.

- While thunderstorm, lightning, and hail probability is defined using a statistical probability, the scale is not specific to the planning area and the plan does not use the term 'severe thunderstorms' and instead it uses 'thunderstorm, lightning, and hail'. From the plan 'There are about 100,000 thunderstorms each year in the United States and approximately 10% of those results in severe thunderstorms.' *Consider changing the hazard to severe thunderstorms*. The plan later identifies a historical frequency but does not use that to include a probability of future occurrences, from the plan 'Between 2019 and 2024 in Audubon County, there were 20 days with thunderstorm/lightning/hail instances. There were eight days with hail reported, and twelve with thunderstorm wind reported.' The plan later uses general descriptors but does not define them 'Audubon County is likely to experience thunderstorms/lighting/hail during the planning period… Research indicates that these the county is likely to expect two to four hailstorms annually… Based on information collected from FEMA for the Iowa Hazard Mitigation Plan, Audubon County is categorized as experiencing relatively low hail expected annual loss and very low lightning expected annual loss.' With multiple definitions of probability at various scales, it is unclear which quantitative measure applies to the general descriptors. *It is encouraged to incorporate a table with general descriptors at the beginning of the risk assessment that have a standardized quantitative definition*. This allows for consistency of general descriptors across the identified hazards.

B1f – Risk assessment tables in the appendix include jurisdiction specific unique and varied risk information. *In the next update of the plan consider incorporating more asset information to the risk assessment tables.*

B2a –

- *In the next update of the plan continue focusing on the assets at the participant level and how they are vulnerable to hazards.* From the LMPPG: 'Assets are determined by the community and include but are not limited to: People, Structures, Systems, Natural, historic, and cultural resources, and Activities that have value to the community.' *Continue incorporating a variety of asset types in the vulnerability sections of the risk assessment.*
- Problem Statements highlight risk in the communities and include possible solutions, demonstrating solution-oriented management. *Continue expanding on problem statements and potential mitigation actions in the risk assessment that tie to the mitigation strategy in the next update of the plan.*

B2b – The plan follows a best practice by identifying community specific impacts on the participants assets. *In the next update of the plan continue expanding on potential impacts on each participating jurisdiction and its identified assets.* Gaps and limitations may be addressed as actions in the mitigation strategy.

Strength:

B1b – Maps demonstrate location of each identified hazard within the planning area; included critical facilities maps in the appendix.

Element C: Mitigation Strategy

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))		
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?	Chapter 2: 16-17 Appendix B: 120-121 Appendix C: 151-152 Appendix D: 171-172 Appendix E: 200 Appendix F: 220	Met
C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?	Chapter 6: 82 Appendix B: 143 Appendix C: 164 Appendix D: 191 Appendix E: 212 Appendix F: 236	Met
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?	Chapter 6: 82 Appendix B: 120 Appendix C: 151 Appendix D: 172 Appendix E: 200 Appendix F: 220	Met

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))		
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?	Pages 73 Appendix B: 132 141 Appendix C: 160 Appendix D: 183 189 Appendix E: 208 Appendix F: 228	Met
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?	Pages 74-78 Appendix B: 133-138 142 Appendix C: 161-163 Appendix D: 184-186 190 Appendix E: 209-211 Appendix F: 229-235	Met
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment?	Pages 74-78 Appendix B: 133-138 142 Appendix C: 161-163 Appendix D: 184-186 190 Appendix E: 209-211 Appendix F: 229-235	Met

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))		
C5-a. Does the plan describe the criteria used for prioritizing actions?	Chapter 5 Pages: 69-72	Met
C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?	Pages 74-78 Appendix B: 133-138 142 Appendix C: 161-163 Appendix D: 184-186 190 Appendix E: 209-211 Appendix F: 229-235	Met

ELEMENT C REQUIRED REVISIONS

Required Revision:

None.

Opportunity for Improvement:

C1a – It is encouraged to expand on the schools existing authorities, policies, programs, funding and resources in the next update of the plan.

C1b – It is encouraged to expand on the school narratives about the ability to expand on and improve the capabilities in the next update of the plan.

C3a – Missing from the goals is language about 'long-term' reduction of vulnerabilities. *It is encouraged to include a scale related to time to the current goal language, this helps clarify the intention of reducing the long-term risks and vulnerabilities identified in the plan.*

C4b –

- Expand on the language in the action descriptions to include 'critical facilities' for those that are missing it; it is encouraged to include this language in actions related to safe rooms, generators, or heating and cooling centers.
- Overall, the plan includes a comprehensive list of actions, however, a few of the actions listed are preparedness and response in nature or highlight current capabilities; rather than mitigation. Non-mitigation actions can be included in a plan but will not be considered as part of the mitigation action requirement. We would like to note that there can be value in including preparedness and response actions or current capabilities for community records, but they may not contribute to a reduction in risk.

- For some hazards, the community had only Education and Outreach mitigation actions. From the LMPPG: 'The mitigation strategy must include an analysis of a comprehensive range of actions or projects that the participants considered to specifically address vulnerabilities identified in the risk assessment.' *In the next update of the plan, we recommend considering a 'comprehensive range' of actions or projects to address vulnerabilities identified in the risk assessment; this can be accomplished by building and expanding on the Education and Outreach actions for a hazard.*
- Consider expanding on mitigation action descriptions with a status of ongoing. Some ongoing activities are valid mitigation actions, while others are best classified as capabilities. If mitigation actions are outlining existing, routine capabilities they should specify how the activity is building on and/or improving the capability. Maintaining existing capabilities does not reduce current vulnerabilities.
- From the LMPPG 'The actions must be achievable and demonstrate how the mitigation activities reduce the risks identified in the risk assessment.' In the next update of the plan continue including community specific hazard profiles and expanding on the narratives to highlight how the mitigation activities reduce the risks identified in the risk that are specific to the mitigation actions.
- *It is encouraged to include hazard specific action descriptions and/or supporting risk narratives when addressing mitigation actions that are multi-hazard; including but not limited to generators, saferooms, building codes, sirens, signage, notification systems, updating plans, public education actions, etc.* While the mitigation action by itself contributes to long term solutions it is important to include details that clarify how the action is reducing current and future vulnerabilities related to each participant so that the action is achievable and demonstrates risks identified in the risk assessment.
- In the next update of the plan consider expanding on all hazard actions to outline the mitigation activities with hazard specific details. Consider tying messaging directly to a hazard, population, and vulnerability from the risk assessment. Consider Including information on frequency, delivery methods, and how success will be tracked or evaluated. Consider specifying who the audience is and what the intended behavior or outcome is.

C5b –

- *Consider expanding on applicable potential funding sources in the next update of the plan.* Some actions only listed one potential funding source and have potential to be expanded on.
- *There is potential to include HMGP: The 5 percent initiative to mitigation actions related to public awareness and/or education.* From Hazard Mitigation Assistance Program and Policy Guide: 'Activities that may be eligible under the 5 Percent Initiative include… Public awareness or education campaigns about mitigation.'

Strength:

C3a – Included Goals addressed in Mitigation Strategy tables.

C4b – The plan follows a best practice by including General Mitigation Types in mitigation action tables.

C5a – Chapter 5 clearly describes how actions are prioritized, using a benefit, cost, and priority criteria.

C5b – Identified specific departments responsible for administering each action in the Action Plan with specific timelines.

Element D: Plan Maintenance

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))		
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?	Chapter 6: Page 82	Met
D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))		
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?	Chapter 6 Pages 79-82	Met
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.	Chapter 6 Pages 79-82	Met
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?	Chapter 6 Pages 79-82	Met
D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))		
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?	Chapter 6 Pages 79-82 Appendix B: 143 Appendix C: 164 Appendix D: 191 Appendix E: 212 Appendix F: 236	Met

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?	Chapter 6 Pages 79-82 Appendix B: 143 Appendix C: 164 Appendix D: 191 Appendix E: 212 Appendix F: 236	Met
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?	Chapter 6 Pages 79-82 Appendix B: 143 Appendix C: 164 Appendix D: 191 Appendix E: 212 Appendix F: 236	Met

ELEMENT D REQUIRED REVISIONS

Required Revision:

None.

Opportunity for Improvement:

D1a – *Continue expanding on public participation after the plan's adoption, it can increase community involvement in mitigation efforts.* While the plan included a clear process for annual public meetings or hearings for public comment for each jurisdiction it could highlight more opportunities for public participation. Examples include but are not limited to: periodic presentations, annual questionnaires or surveys, postings on social media, and interactive websites.

D2 – From the LMPPG in the overall intent of element D: 'The mitigation plan is a living document that guides actions over time. Continually documenting the process makes the next plan update easier. The plan is a blueprint for reducing risk and protecting community investments. Having a process for maintaining the plan reflects the recognition that things change.' *Consider including narrative descriptions of changes to monitoring, evaluating, and updating methods since the last update of the plan.* This helps to keep the plan a 'living' document and for community record to evaluate risk reduction and community investment. Plan maintenance efforts are a blueprint that guide actions over time.

Strength:

D2c – Included an update method with an itemized list of steps.

D3a – Included a clear community process to integrate the plan's data, information, and hazard mitigation goals and actions into other planning mechanisms.

D3b – There was a comprehensive range of planning mechanisms identified in the plan that were reflective of the identified capabilities.

D3c – Each community profile includes planning mechanisms specific to each jurisdiction.

Element E: Plan Update

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))		
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?	Chapter 2: Page 17 Appendix B: 121 Appendix C: 152 Appendix D: 172 Appendix E: 200 Appendix F: 220	Met
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))		
E2-a. Does the plan describe how it was revised due to changes in community priorities?	Chapter 5: 72-78 Appendix B: 131-138 141-142 Appendix C: 159-163 Appendix D: 182-186 189-190 Appendix E: 207-211 Appendix F: 227-235	Met
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?	Chapter 5: 72-73 Appendix B: 131-132 Appendix C: 159 Appendix D: 182 Appendix E: 207 Appendix F: 227-228	Met

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?	Chapter 6: Page 82 Appendix B: 143 Appendix C: 164 Appendix D: 191 Appendix E: 212 Appendix F: 236	Met

ELEMENT E REQUIRED REVISIONS

Required Revision:

None.

Opportunity for Improvement:

E1a –Outlook and Future Development sections highlight changes in development and how it increases or decreases vulnerability of jurisdictions since the previous plan approval*. There is potential to add tables that address if a mitigation action addresses current or future development. There is potential to add sections to the vulnerability assessment identifying potential loss of different development categories including: existing development, previous development, and future development.*

E2a –*Continue assessing how priorities and progress is measured and revised in future plan updates to increase implementation of local mitigation efforts.* From the LMPPG, 'The plan update is an opportunity for the jurisdiction to assess its previous goals and action plan, evaluate progress in implementing hazard mitigation actions, and adjust its actions to address the current realities.'

Strength:

E2a – Highlighted changes in priorities in the mitigation strategy 'There have been some changes in the plan's project priorities since the last update.' This will help to continue to effectively represent the jurisdiction's overall strategy for reducing its risks from natural hazards.

E2b – Tables 5.1 implements a best practice by providing a summary of the status of completed, underway, ongoing, future, or not implemented.

Element F: Plan Adoption

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F1-a. Does the participant include documentation of adoption?	N/A	N/A
F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F2-a. Did each participant adopt the plan and provide documentation of that adoption?	Appendix A: 114 Appendix B: 144 145 Appendix C: 165 Appendix D: 192 193 Appendix E: Amended Appendix F: 237	Met
ELEMENT F REQUIRED REVISIONS		

Required Revision:

None.

Element G: High Hazard Potential Dams (Optional)

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?		
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?	N/A	N/A
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?	N/A	N/A

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD2. Did the plan address HHPDs in the risk assessment?		
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?	N/A	N/A
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?	N/A	N/A
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?		
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?	N/A	N/A
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?	N/A	N/A
HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?		
HHPD4-a. Does the plan describe specific actions to address HHPDs?	N/A	N/A
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?	N/A	N/A
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?	N/A	N/A
HHPD Required Revisions		

Based on FEMA review of the National Inventory of Dams, the planning area has no eligible High Hazard Potential Dams (HHPD) and the HHPD optional planning elements have not been evaluated. Per the Rehabilitation of HHPD grant guidance, all HHPD optional planning elements must be addressed and approved by FEMA for a sub-applicant to be eligible for the program. If dam eligibility changes within the HMP planning area and a plan participant(s) is interested in the HHPD grant program, a request to review these elements will be supported.

Element H: Additional State Requirements (Optional)

Element H Requirements	Location in Plan (section and/or page number)	Met / Not Met
This space is for the State to include additional requirements.		

Mitigation plans may include additional content to meet Element H: Additional State Requirements or content the local government included beyond applicable FEMA mitigation planning requirements. FEMA approval does not include the review or approval of content that exceeds the applicable FEMA mitigation planning requirements.