

Flood Risk Report

West Fork Big Blue, 10270203

Nebraska

Report Number 1

1/3/2017

FEMA

RiskMAP

Increasing Resilience Together

Project Area Community List

Community Name
Adams County*
City of Hastings*
Village of Prosser*
Clay County*
City of Harvard
Village of Saronville
City of Sutton
Village of Trumbull
Fillmore County*
Village of Exeter
Village of Fairmont
Village of Grafton
Hall County*
Village of Doniphan*
Hamilton County*
City of Aurora*
Village of Giltner
Village of Hampton
Village of Stockham
Saline County*
Village of Dorchester*
Seward County*
Village of Beaver Crossing
Village of Cordova
Village of Utica
York County*
Village of Bradshaw
City of Henderson
Village of Lushton

Community Name
Village of McCool Junction
Village of Waco
City of York*

Preface

The Department of Homeland Security (DHS), Federal Emergency Management Agency's (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program provides states, tribes, and local communities with flood risk information and tools that they can use to increase their resilience to flooding and better protect their citizens. By pairing accurate floodplain maps with risk assessment tools and planning and outreach support, Risk MAP has transformed traditional flood mapping efforts into an integrated process of identifying, assessing, communicating, planning for, and mitigating flood-related risks.

This Flood Risk Report (FRR) provides non-regulatory information to help local or tribal officials, floodplain managers, planners, emergency managers, and others better understand their flood risk, take steps to mitigate those risks, and communicate those risks to their citizens and local businesses.

Because flood risk often extends beyond community limits, the FRR provides flood risk data for the entire Flood Risk Project as well as for each individual community. This also emphasizes that flood risk reduction activities may impact areas beyond jurisdictional boundaries.

Flood risk is always changing, and there may be other studies, reports, or sources of information available that provide more comprehensive information. The FRR is not intended to be regulatory or the final authoritative source of all flood risk data in the project area. Rather, it should be used in conjunction with other data sources to provide a comprehensive picture of flood risk within the project area.

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FLOOD RISK REPORT

1 Introduction

1.1 About Flood Risk

Floods are naturally occurring phenomena that can and do happen almost anywhere. In its most basic form, a flood is an accumulation of water over normally dry areas. Floods become hazardous to people and property when they inundate an area where development has occurred, causing losses. Mild flood losses may have little impact on people or property, such as damage to landscaping or the generation of unwanted debris. Severe flooding can destroy buildings, ruin crops, and cause critical injuries or death.



Flooding is a natural part of our world and our communities. Flooding becomes a significant hazard, however, when it intersects with the built environment.

1.1.1 Calculating Flood Risk

It is not enough to simply identify where flooding may occur. Just because one knows where a flood occurs does not mean they know the **risk** of flooding. The most common method for determining flood risk, also referred to as vulnerability, is to identify the probability of flooding and the consequences of flooding. In other words:

Flood Risk = Probability x Consequences; where

- **Probability** = the likelihood of occurrence
- **Consequences** = the estimated impacts associated with the occurrence

The probability of a flood is the likelihood that a flood will occur. The probability of flooding can change based on physical, environmental, and/or contributing engineering factors. Factors affecting the probability that a flood will impact an area range from changing weather patterns to the existence of mitigation projects. The ability to assess the probability of a flood and the level of accuracy for that assessment are also influenced by modeling methodology advancements, better knowledge, and longer periods of record for the water body in question.

The consequences of a flood are the estimated impacts associated with the flood occurrence. Consequences relate to humans' activities within an area and how a flood impacts the natural and built environments.

Which picture below shows more flood risk?





Even if you assume that the flood in both pictures was the same probability—let's say a 10-percent-annual-chance flood—the consequences in terms of property damage and potential injury as a result of the flood in the bottom picture are much more severe. Therefore, the flood risk in the area shown in the bottom picture is higher.

1.1.2 Flood Risk Products

Through Risk MAP, FEMA provides communities with updated Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) Reports that focus on the probability of floods and that show where flooding may occur as well as the calculated 1-percent-annual-chance flood elevation. The 1-percent-annual-chance flood, also known as the base flood, has a 1% chance of being equaled or exceeded in any given year. FEMA understands that flood risk is dynamic—that flooding does not stop at a line on a map—and as such, provides the following flood risk products:



Whether or not an area might flood is one consideration. The extent to which it might flood adds a necessary dimension to that understanding.

- **Flood Risk Report (FRR)**: The FRR presents key risk analysis data for the Flood Risk Project.
- **Flood Risk Map (FRM)**: Like the example found in Section 3.1 of this document, the FRM shows a variety of flood risk information in the project area. More information about the data shown on the FRM may be found in Section 2 of this report.
- **Flood Risk Database (FRD)**: The FRD is in Geographic Information System (GIS) format and houses the flood risk data developed during the course of the flood risk analysis that can be used and updated by the community. After the Flood Risk Project is complete, this data can be used in many ways to visualize and communicate flood risk within the Flood Risk Project.

These Flood Risk Products provide flood risk information at both the Flood Risk Project level and community level (for those portions of each community within the Flood Risk Project). They demonstrate how decisions made within a Flood Risk Project can impact properties downstream, upstream, or both. Community-level information is particularly useful for mitigation planning and emergency management activities, which often occur at a local jurisdiction level.

1.2 Uses of this Report

The goal of this report is to help inform and enable communities and tribes to take action to reduce flood risk. Possible users of this report include:



Vulnerability of infrastructure is another important consideration.

- Local elected officials
- Floodplain managers
- Community planners
- Emergency managers
- Public works officials
- Other special interests (e.g., watershed conservation groups, environmental awareness organizations, etc.)

State, local, and tribal officials can use the summary information provided in this report, in conjunction with the data in the FRD, to:

- **Update local hazard mitigation plans.** As required by the 2000 Federal Stafford Act, local hazard mitigation plans must be updated at least every five (5) years. Summary information presented in Section 3 of this report and the FRM can be used to identify areas that may need additional focus when updating the risk assessment section of a local hazard mitigation plan. Information found in Section 4 pertains to the different mitigation techniques and programs and can be used to inform decisions related to the mitigation strategy of local plans.
- **Update community comprehensive plans.** Planners can use flood risk information in the development and/or update of comprehensive plans, future land use maps, and zoning regulations. For example, zoning codes may be changed to better provide for appropriate land uses in high-hazard areas.
- **Update emergency operations and response plans.** Emergency managers can identify low-risk areas for potential evacuation and sheltering and can help first responders avoid areas of high-depth flood water. Risk assessment results may reveal vulnerable areas, facilities, and infrastructure for which planning for continuity of operations plans (COOP), continuity of government (COG) plans, and emergency operations plans (EOP) would be essential.



Flooding along the Wabash River in Clark County, Illinois, contributed to a federal disaster declaration on June 24, 2008.

- **Develop hazard mitigation projects.** Local officials (e.g., planners and public works officials) can use flood risk information to re-evaluate and prioritize mitigation actions in local hazard mitigation plans.
- **Communicate flood risk.** Local officials can use the information in this report to communicate with property owners, business owners, and other citizens about flood risks, changes since the last FIRM, and areas of mitigation interest. The report layout allows community information to be extracted in a fact sheet format.
- **Inform the modification of development standards.** Floodplain managers, planners, and public works officials can use information in this report to support the adjustment of development standards for certain locations. For example, heavily developed areas tend to increase floodwater runoff because paved surfaces cannot absorb water, indicating a need to adopt or revise standards that provide for appropriate stormwater retention.

The Flood Risk Database, Flood Risk Map, and Flood Risk Report are “non-regulatory” products. They are available and intended for community use but are neither mandatory nor tied to the regulatory development and insurance requirements of the National Flood Insurance Program (NFIP). They may be used as regulatory products by communities if authorized by state and local enabling authorities.

1.3 Sources of Flood Risk Assessment Data Used

To assess potential community losses, or the consequences portion of the "risk" equation, the following data is typically collected for analysis and inclusion in a Flood Risk Project:

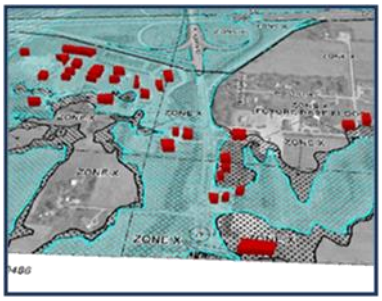
- Information about local assets or resources at risk of flooding
- Information about the physical features and human activities that contribute to that risk
- Information about where the risk is most severe

For most Flood Risk Projects, FEMA uses the following sources of flood risk information to develop this report:

- Hazus-estimated flood loss information
- New engineering analyses (e.g., coastal, hydrologic, and/or hydraulic modeling) to develop new flood boundaries
- Locally supplied data (see Section 7 for a description)
- Sources identified during the Discovery process







FEMA data can be leveraged to identify and measure vulnerability by including local building information (i.e. building type). The examples above show various ways to display flooding intersecting with buildings.

1.4 Related Resources

For a more comprehensive picture of flood risk, FEMA recommends that state and local officials use the information provided in this report in conjunction with other sources of flood risk data, such as those listed below.

- **FIRMs and FIS Reports.** This information indicates areas with specific flood hazards by identifying the limit and extent of the 1-percent-annual-chance floodplain and the 0.2-percent-annual-chance floodplain. FIRMs and FIS Reports do not identify all floodplains in a Flood Risk Project. The FIS Report includes summary information regarding other frequencies of flooding, as well as flood profiles for riverine sources of flooding. In rural areas and areas for which flood hazard data are not available, the 1-percent-annual-chance floodplain may not be identified. In addition, the 1-percent-annual-chance floodplain may not be identified for flooding sources with very small drainage areas (less than 1 square mile).
- **Hazus Flood Loss Estimation Reports.** Hazus can be used to generate reports, maps and tables on potential flood damage that can occur based on new/proposed mitigation projects or future development patterns and practices. Hazus can also run specialized risk assessments, such as what happens when a dam or levee fails. Flood risk assessment tools are available through other agencies as well, including the

National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACE). Other existing watershed reports may have a different focus, such as water quality, but may also contain flood risk and risk assessment information. See Section 6 for additional resources.

- **Flood or multi-hazard mitigation plans.** Local hazard mitigation plans include risk assessments that contain flood risk information and mitigation strategies that identify community priorities and actions to reduce flood risk. This report was informed by any existing mitigation plans in the Flood Risk Project.
- **Emergency Action Plans.** Emergency Action Plans are formal documents that identify potential emergency conditions at a dam and specify preplanned actions to be followed to minimize property damage and loss of life. The plans specify actions the dam owner should take to moderate or alleviate the identified problems at the dam. These plans usually contain inundation maps downstream of the dam to show emergency management authorities critical areas for action in case of an emergency. This report consulted available EAPs for those dams that were studied.
- **FEMA Map Service Center (MSC).** The MSC has useful information, including fly sheets, phone numbers, data, etc. Letters of Map Change are also available through the MSC. The user can view FIRM databases and the National Flood Hazard Layer (NFHL) Database.

2 Flood Risk Analysis

2.1 Overview

Flood hazard identification uses FIRMs, and FIS Reports identify where flooding can occur along with the probability and depth of that flooding. Flood risk assessment is the systematic approach to identifying how flooding impacts the environment. In hazard mitigation planning, flood risk assessments serve as the basis for mitigation strategies and actions by defining the hazard and enabling informed decision making. Fully assessing flood risk requires the following:

- Identifying the flooding source and determining the flood hazard occurrence probability
- Developing a complete profile of the flood hazard including historical occurrence and previous impacts
- Inventorying assets located in the identified flood hazard area
- Estimating potential future flood losses caused by exposure to the flood hazard area



Flooding impacts non-populated areas too, such as agricultural lands and wildlife habitats.

Flood risk analyses are different methods used in flood risk assessment to help quantify and communicate flood risk. Flood risk analysis can be performed on a large scale (state, community) level and on a very small scale (parcel, census block). Advantages of large-scale flood risk analysis, especially at the watershed level, include identifying how actions and development in one community can affect areas up- and downstream. On the parcel or census block level, flood risk analysis can provide actionable data to individual property owners so they can take appropriate mitigation steps.

2.2 Analysis of Risk

The FRR, FRM, and FRD contain a variety of flood risk analysis information and data to help describe and visualize flood risk within the project area. Depending on the scope of the Flood Risk Project for this project area, this information may include some or all of the following elements:

- Changes Since Last FIRM
- Flood Depth and Analysis Grids
- Flood Risk Assessments
- Areas of Mitigation Interest

State and Local Hazard Mitigation Plans are required to have a comprehensive all-hazard risk assessment. The flood risk analyses in the FRR, FRM, and FRD can inform the flood hazard portion of a community's or state's risk assessment. Further, data in the FRD can be used to develop information that meets the requirements for risk assessments as it relates to the hazard of flood in hazard mitigation plans.

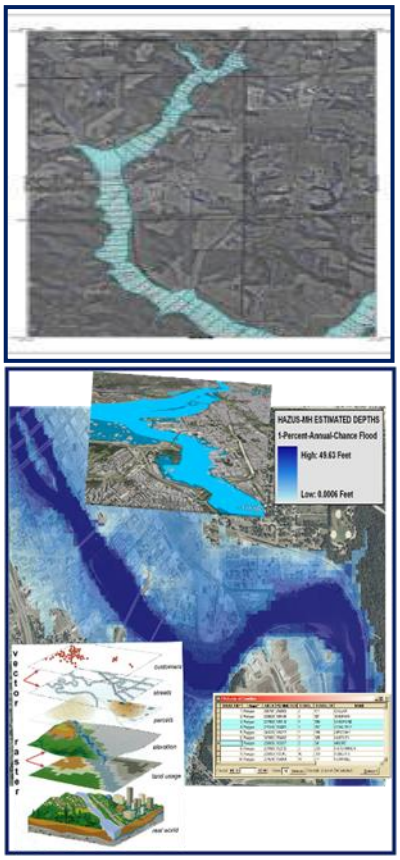
2.2.1 Changes Since Last FIRM

The Changes Since Last FIRM (CSLF) dataset, stored in the FRD and shown in Section 3 of this report, illustrates where changes to flood risk may have occurred since the last FIRM was published for the subject area. Communities can use this information to update their mitigation plans, specifically quantifying "what is at risk" and identifying possible mitigation activities.

The CSLF dataset identifies changes in the Special Flood Hazard Area (SFHA) and floodway boundary changes since the previous FIRM was developed. These datasets quantify land area increases and decreases to the SFHA and floodway, as well as areas where the flood zone designation has changed (e.g., Zone A to AE, AE to VE, shaded Zone X protected by levee to Zone AE for de-accredited levees).

The CSLF dataset is created in areas that were previously mapped using digital FIRMs. The CSLF dataset for this project area includes:

- **Floodplain and/or Floodway Boundary Changes**: Any changes to the existing floodplain or floodway boundaries are depicted in this dataset
- **Floodplain Designation Changes**: This includes changed floodplain designations (e.g., Zone A to Zone AE).



Floodplain maps have evolved considerably from the older paper-based FIRMs to the latest digital products and datasets.

CSLF data can be used to communicate changes in the physical flood hazard area (size, location) as part of the release of new FIRMs. It can also be used in the development or update of hazard mitigation plans to describe changes in hazard as part of the hazard profile.

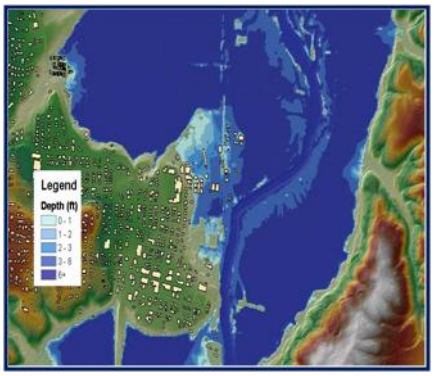
CSLF data is shown in the FRR, and underlying data is stored in the FRD.

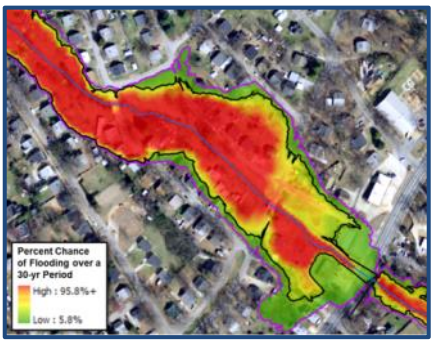
2.2.2 Flood Depth and Analysis Grids

Grids are FEMA datasets provided in the FRD to better describe the risk of the flood hazard. Much like the pixels in a photo or graphic, a grid is made up of square cells, where each grid cell stores a value representing a particular flood characteristic (elevation, depth, velocity, etc.) While the FIRM and FIS Report describe "what" is at risk by identifying the hazard areas, water surface, flood depth, and other analysis grids can help define "how bad" the risk is within those identified areas. These grids are intended to be used by communities for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The Flood Depth and Analysis Grids provide an alternative way to visualize how a particular flood characteristic (depth, velocity, etc.) vary within the floodplain. Since they are derived from the engineering modeling results, they are typically associated with a particular frequency-based flooding event (e.g., 1-percent-annual-chance event). Grids provided in the FRD for this project area include the following:

- **Water Surface Elevation Grids (for the calculated flood frequencies included in the FIS Report):** This dataset represents the flood elevations calculated for each modeled flood frequency.
- **Flood Depth Grids (for the calculated flood frequencies included in the FIS Report):** Flood Depth Grids are created for each flood frequency calculated during the course of a Flood Risk Project. These grids communicate flood depth as a function of the difference between the calculated water surface elevation and the ground. Five grids will normally be delivered for riverine areas for the standard flood frequencies (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance).

  Depth grids form the basis for refined flood risk assessments (as presented in a table in Section 3 of this report) and are used to calculate potential flood losses for display on the FRM and for tabular presentation in this report. Depth grids may also be used for a variety of ad-hoc risk visualization and mitigation initiatives.





Grid data can make flood mapping more informative. The top image is a flood depth grid showing relative depths of water in a scenario flood event. The bottom image is a percent annual chance of flooding grid, which shows inundation areas of various frequency floods.

Grid data can be used to communicate the variability of floodplains, such as where floodplains are particularly deep or hazardous, where residual risks lie behind levees, and where losses may be great after a flood event. For mitigation planning, grid data can inform the hazard profile and vulnerability analysis (what is at risk for different frequencies) and can be used for preliminary benefit-cost analysis screening. For floodplain management, higher regulatory standards can be developed in higher hazard flood prone areas (i.e., 10-percent-annual-chance floodplains or deep floodplains).

Grid data is stored in the FRD, and a list of available grid data is provided in the FRR.

- **Percent Annual Chance of Flooding Grid:** This is a grid dataset that represents the percent annual chance of flooding for locations along a flooding source. This grid uses the five standard flood frequencies.

- **Percent Chance of Flooding over a 30-Year Time Period Grid:** This is a grid dataset that represents the estimated likelihood of flooding at least once within a 30-year period, which is the average lifespan for a home mortgage, for all locations within the extent of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplain.

2.2.3 Flood Risk Assessments

Flood risk assessment results reported in the FRR were developed using a FEMA flood loss estimation tool, Hazus. Hazus (www.fema.gov/hazus) is a nationally-applicable and standardized risk assessment tool that estimates potential losses from earthquakes, floods, and hurricanes. It uses GIS technology to estimate physical, economic, and social impacts of disasters, Hazus can be used to help individuals and communities graphically visualize the areas where flood risk is highest. Some benefits of using Hazus include the following:



Hazus is a loss estimation methodology developed by FEMA for flood, wind, and earthquake hazards. The methodology and data established by Hazus can also be used to study other hazards.

- Outputs that can enhance state and local mitigation plans and help screen for cost-effectiveness in FEMA mitigation grant programs
- Analysis refinement through updating inventory data and integrating data produced using other flood models
- Widely available support documents and networks (Hazus Users Groups)

Files from the FRD can be imported into Hazus to develop other risk assessment information including:

- Debris generated after a flood event
- Dollar loss of the agricultural products in a study region
- Utility system damages in the region
- Vehicle loss in the study region
- Damages and functionality of lifelines such as highway and rail bridges, potable water, and wastewater facilities

Scenario-Based Flood Loss Estimates:

Scenario-based flood losses have been calculated using Hazus for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events. In this report, these losses are expressed in dollar amounts and are provided for the Flood Risk Project area only, even though results are shown for the entire watershed and at the local jurisdiction level.

Loss estimates are based on best available data, and the methodologies applied result in an approximation of risk. These estimates should be used to understand relative risk from flood and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, demographics, or economic parameters).

Flood loss estimates in this report are being provided at the project and community levels for multiple flood frequencies, and include the following:

- **Residential Asset Loss**: These include direct building losses (estimated costs to repair or replace the damage caused to the building) for all classes of residential structures including single family, multi-family, manufactured housing, group housing, and nursing homes. This value also includes content losses.
- **Commercial Asset Loss**: These include direct building losses for all classes of commercial buildings including retail, wholesale, repair, professional services, banks, hospitals, entertainment, and parking facilities. This value also includes content and inventory losses.
- **Other Asset Loss**: This includes losses for facilities categorized as industrial, agricultural, religious, government, and educational. This value also includes content and inventory losses.
- **Business Disruption**: This includes the losses associated with the inability to operate a business due to the damage sustained during the flood. Losses include inventory, income, rental income, wage, and direct output losses, as well as relocation costs.
- **Annualized Losses**: Annualized losses are calculated using Hazus by taking losses from multiple events over different frequencies and expressing the long-term average by year. This factors in historic patterns of frequent smaller floods with infrequent but larger events to provide a balanced presentation of flood damage.

Flood risk assessment data can be used in many ways to support local decision making and explanation of flood risk. For mitigation planning purposes, loss data can be used to help meet requirements to develop loss information for the hazard of flood. Also, the FRM can show where flood risk varies by geographic location. For emergency management, risk assessment data can help forecast losses based on predicted events, and resources can be assigned accordingly. Loss information can support floodplain management efforts, including those to adopt higher regulatory standards. Awareness of at-risk essential facilities and infrastructure also encourages mitigation actions to protect citizens from service disruption should flooding occur.

Flood risk assessment loss data is summarized in the FRR and on the FRM and stored in the FRD.

- **Loss Ratio:** The loss ratio expresses the scenario losses divided by the total building value for a local jurisdiction and can be a gage to determine overall community resilience as a result of a scenario event. For example, a loss ratio of 5 percent for a given scenario would indicate that a local jurisdiction would be more resilient and recover more easily from a given event, versus a loss ratio of 75 percent which would indicate widespread losses. An annualized loss ratio uses the annualized loss data as a basis for computing the ratio. Loss ratios are not computed for business disruption. These data are presented in the FRR.

2.2.4 Areas of Mitigation Interest

Many factors contribute to flooding and flood losses. Some are natural, and some are not. In response to these risks, there has been a focus by the Federal government, State agencies, and local jurisdictions to mitigate properties against the impacts of flood hazards so that future losses and impacts can be reduced. An area identified as an Area of Mitigation Interest (AoMI) is an important element of defining a more comprehensive picture of flood risk and mitigation activity in a watershed, identifying target areas and potential projects for flood hazard mitigation, encouraging local collaboration, and communicating how various mitigation activities can successfully reduce flood risk.

This report and the FRM may include information that focuses on identifying Areas of Mitigation Interest that may be contributing (positively or negatively) to flooding and flood losses in the Flood Risk Project. AoMIs are identified through coordination with local stakeholders; through revised hydrologic and hydraulic and/or coastal analyses; by leveraging other studies or previous flood studies; from community mitigation plans, floodplain management plans, and local surveys; and from the mining of federal government databases (e.g., flood claims, disaster grants, and data from other agencies). Below is a list of the types of Areas of Mitigation Interest that may be identified in this Flood Risk Report, shown on the Flood Risk Map, and stored in the Flood Risk Database:

- **Dams**

  A dam is a barrier built across a waterway for impounding water. Dams vary from impoundments that are hundreds of feet tall and contain thousands of acre-feet of water (e.g., Hoover Dam) to small dams that are a few feet high and contain only a few acre-feet of water (e.g., small residential pond). “Dry dams,” which are designed to contain water only during floods and do not impound water except for the purposes of flood control, include otherwise dry land behind the dam.

  Dams vary in size and shape, the amount of water they impound, and their assigned hazard classification.

  While most modern, large dams are highly engineered structures with components such as impervious cores and emergency spillways, most smaller and older dams are not. State dam safety programs emerged in the 1960s, and the first Federal Guidelines for Dam Safety were not prepared until 1979. By this time, the vast majority of dams in the United States had already been constructed.

  - **Reasons dams are considered AoMIs:**
    - Many older dams were not built to any particular standard and thus may not withstand extreme rainfall events. Older dams in some parts of the country are made out of an assortment of materials. These structures may not have any capacity to release water and could be overtopped, which could result in catastrophic failure.

- Dams may not always be regulated, given that the downstream risk may have changed since the dam was constructed or since the hazard classification was determined. Years after a dam is built, a house, subdivision, or other development may be constructed in the dam failure inundation zone downstream of the dam. Thus, a subsequent dam failure could result in downstream consequences, including property damage and the potential loss of life. Since these dams are not regulated, it is impossible to predict how safe they are.



This dam failure caused flooding that damaged several homes and vehicles.

- A significant dam failure risk is structural deficiencies associated with older dams that are not being adequately addressed today through needed inspection/maintenance practices.
- For larger dams a flood easement may have been obtained on a property upstream or downstream of the dam. However, there may have been buildings constructed in violation of the flood easement.
- When a new dam is constructed, the placement of such a large volume of material in a floodplain area (if that is the dam location) will displace flood waters and can alter how the watercourse flows. This can result in flooding upstream, downstream, or both.
- For many dams, the dam failure inundation zone is not known. Not having knowledge of these risk areas could lead to unprotected development in these zones.

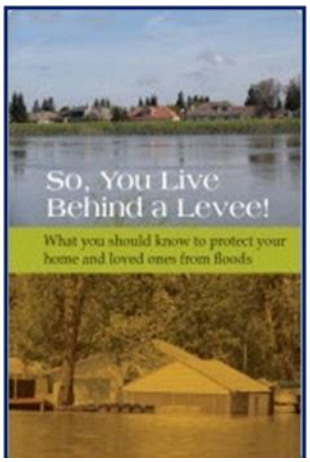
- **Levees**

  FEMA defines a levee as “a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.” Levees are sometimes referred to as dikes. Soil used to construct a levee is compacted to make the levee as strong and stable as possible. To protect against erosion and scouring, levees can be covered with everything from grass and gravel to harder surfaces like stone (riprap), asphalt, or concrete.

  Similar to dams, levees have not been regulated in terms of safety and design standards until relatively recently. Many older levees were constructed in a variety of ways, from a farmer piling dirt along a stream to prevent nuisance flooding to levees made out of old mining spoil material. As engineered structures, levees are designed to a certain height and can fail if a flood event is greater than anticipated.

A floodwall is a vertical wall that is built to reduce the flood hazard in a similar manner as a levee. Typically made of concrete or steel, floodwalls often are erected in urban locations where there is not enough room for a levee. Floodwalls are sometimes constructed on a levee crown to increase the levee's height.

Most new dams and levees are engineered to a certain design standard. If that design is exceeded, they could be overtopped and fail catastrophically, causing more damage than if the levee was not there in the first place. Few levees anywhere in the nation are built to more than a 1-percent-annual-chance flood, and the areas behind them are still at some risk for flooding. In some states, the flooding threat can extend up to 15 miles from a riverbank. Although the probability of flooding may be lower because a levee exists, risk is nonetheless still present. The American Society of Civil Engineers' publication "So, You Live Behind a Levee!" provides an in-depth explanation of levee and residual risk.



For more information about the risks associated with living behind levees, consult the publication "So, You Live Behind a Levee!" published by the American Society of Civil Engineers at http://content.asce.org/ASCELeveeGuide.html

- **Reasons levees are considered AoMIs:**
  - Like dams, many levees in the United States were constructed using unknown techniques and materials. These levees have a higher failure rate than those that have been designed to today's standards.
  - A levee might not provide the flood risk reduction it once did as a result of flood risk changes over time. Flood risk can change due to a number of factors, including increased flood levels due to climate change or better estimates of flooding, development in the watershed increasing flood levels and settlement of the levee or floodwall, and sedimentation in the levee channel. Increased flood levels mean decreased reduction of the flood hazard. The lack of adequate maintenance over time will also reduce the capability of a levee to contain the flood levels for which it was originally designed.
  - Given enough time, any levee will eventually be overtopped or damaged by a flood that exceeds the levee's capacity. Still, a widespread public perception of levees is that they will always provide protection. This perception may lead to not taking mitigation actions such as purchasing flood insurance.





Canal levee breaches as a result of Hurricane Katrina in New Orleans in 2005. Note damages can be more extensive due to high velocity flood flows than if the levee was not there.

- A levee is a system that can fail due to its weakest point, and therefore maintenance is critical. Many levees in the United States are poorly maintained or not maintained at all. Maintenance also includes maintaining the drainage systems behind the levees so they can keep the protected area dry.

- **Coastal Structures**

  Coastal structures, such as seawalls and revetments, are typically used to stabilize the shoreline to mitigate or prevent flood and/or erosion losses. Structures, such as jetties, groins and breakwaters, are constructed along naturally dynamic shorelines to alter the physical processes (e.g. sediment transport) for purposes that include reduction of long-term erosion rates, improvements to safe navigation (e.g., into ports), and reduction of erosive wave forces impacting a coast.

  - **Reasons coastal structures are considered AoMIs:**

    - Coastal structures may provide flood or erosion protection for one site. However, they may also interrupt the sediment transport process, resulting in accelerated coastal erosion downdrift of the structure.
    - Coastal structures are typically designed to withstand the forces associated with extreme design conditions of waves and water levels. Adequate protection may not be provided if these conditions are exceeded.
    - As with other infrastucture such as roads, bridges, and utilities, regular maintenance of shoreline protection structures is essential to ensure that they continue to provide the intended protection from flooding and erosion.

- **Stream Flow Constrictions**

  A stream flow constriction occurs when a human-made structure, such as a culvert or bridge, constricts the flow of a river or stream. The results of this constriction can be increased damage potential to the structure, an increase in velocity of flow through the structure, and the creation of significant ponding or backwater upstream of the structure. Regulatory standards regarding the proper opening size for a structure spanning a river or stream are not consistent and may be non-existent. Some local regulations require structures to pass a volume of water that corresponds to a certain size rain event; however, under sizing, these openings can result in flood damage to the structure itself. After a large flood event, it is not uncommon to have numerous bridges and culverts “washed out.”

  - **Reasons stream flow constrictions are considered AoMIs:**

    - Stream flow constrictions can back water up on property upstream of the structure if not designed properly.
    - These structures can accelerate the flow through the structure causing downstream erosion if not properly mitigated. This erosion can affect the structure itself, causing undermining and failure.
    - If the constriction is a bridge or culvert, it can get washed out causing an area to become isolated and potentially more difficult to evacuate.

- Washed-out culverts and associated debris can wash downstream and cause additional constrictions.

- **At-Risk Essential Facilities**

  Essential facilities, sometimes called “critical facilities,” are those whose impairment during a flood could cause significant problems to individuals or communities. For example, when a community’s wastewater treatment is flooded and shut down, not only do contaminants escape and flow into the floodwaters, but backflows of sewage can contaminate basements or other areas of the community. Similarly, when a facility such as a hospital is flooded, it can result in a significant hardship on the community not only during the event but long afterwards as well.

  - **Reasons at-risk essential facilities are considered AoMIs:**
    - Costly and specialized equipment may be damaged and need to be replaced.
    - Impairments to facilities such as fire stations may result in lengthy delays in responding and a focus on evacuating the facility itself.
    - Critical records and information stored at these facilities may be lost.

- **Past Flood Insurance Claims and Individual Assistance/Public Assistance Hotspots**

  Assistance provided after flood events (flood insurance in any event and Individual Assistance [IA] or Public Assistance [PA] after declared disasters) occurs in flood affected areas. Understanding geographically where this assistance is being provided may indicate unique flood problems.

  Clusters of past flood insurance claims can show where there is a repetitive flood problem.

  Flood insurance claims are not always equally distributed in a community. Although estimates indicate that 20 to 50 percent of structures in identified flood hazard areas have flood insurance, clusters of past claims may indicate where there is a flood problem. However, clusters of past claims and/or areas where there are high payments under FEMA’s IA or PA Programs may indicate areas of significant flood hazard.

  - **Reasons past claim hotspots are considered AoMIs:**
    - A past claim hotspot may reflect an area of recent construction (large numbers of flood insurance policies as a result of a large number of mortgages) and an area where the as-built construction is not in accordance with local floodplain management regulations.
    - Sometimes clusters of past claims occur in subdivisions that were constructed before flood protection standards were in place, places with inadequate stormwater management systems, or in areas that may not have been identified as SFHAs.

- Clusters of IA or PA claims may indicate areas where high flood insurance coverage or other mitigation actions are needed.

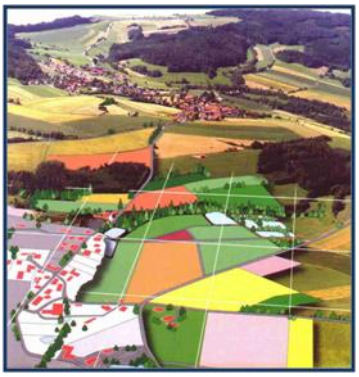
- **Areas of Significant Land Use Change**

  Development, whether it is a 100-lot subdivision or a single lot big box commercial outlet, can result in large amounts of fill and other material being deposited in flood storage areas, thereby increasing flood hazards downstream.

  Additionally, when development occurs, hard surfaces such as parking lots, buildings and driveways do not allow water to absorb into the ground, and more of the rainwater becomes runoff flowing directly into streams. As a result, the "peak flow" in a stream after a storm event will be higher and will occur faster. Without careful planning, major land use changes can affect the impervious area of a site and result in a significant increase in flood risk caused by streams that cannot handle the extra storm water runoff.

  Reasons Areas of Significant Land Use Change are considered AoMIs:

  - Development in areas mapped SFHA reduces flood storage areas, which can make flooding worse at the development site and downstream of it.
  - Impervious surfaces speed up the water flowing in the streams, which can increase erosion and the danger that fast-flowing floodwaters pose to people and buildings.
  - Rezoning flood-prone areas to high densities and/or higher intensity uses can result in more people and property at risk of flooding and flood damage.





Rooftops, pavements, patios, and driveways contribute to the impervious area in a watershed. This occurs in both urban areas and rural areas being developed.

- **Key Emergency Routes Overtopped During Frequent Flooding Events**

  Roads are not always elevated above estimated flood levels, and present a significant flood risk to motorists during flooding events. When alternate routes are available, risks may be reduced, including risks to life and economic loss.



When large highways close due to flooding, traffic is detoured causing inconvenience and economic loss.

  - **Reasons overtopped roads are considered AoMIs:**
    - Such areas, when identified, can be accounted for and incorporated into Emergency Action Plans.
    - Roads may be elevated or reinforced to reduce the risk of overtopping during flood events.

- **Drainage or Stormwater-Based Flood Hazard Areas, or Areas Not Identified as Floodprone on the FIRM But Known to Be Inundated**

  Flood hazard areas exist everywhere. While FEMA maps many of these, others are not identified. Many of these areas may be located in communities with existing, older, and often inadequate stormwater management systems or in very rural areas. Other similar areas could be a result of complex or unique drainage characteristics. Even though they are not mapped, awareness of these areas is important so adequate planning and mitigation actions can be performed.

  - **Reasons drainage or stormwater-based flood hazard areas or unidentified floodprone locations are considered AoMIs:**
    - So further investigation of such areas can occur and, based on scientific data, appropriate mitigation actions can result (i.e., land use and building standards).
    - To create viable mitigation project applications in order to reduce flood losses.

- **Areas of Mitigation Success**

  Flood mitigation projects are powerful tools to communicate the concepts of mitigation and result in more resilient communities. Multiple agencies have undertaken flood hazard mitigation actions for decades. Both structural measures—those that result in flood control structures—and non-structural measures have been implemented in thousands of communities. An extensive list of mitigation actions can be found in Section 4.

  - **Reasons areas of mitigation success are considered AoMIs:**
    - Mitigation successes identify those areas within the community that have experienced a reduction or elimination of flood risk.

- Such areas are essential in demonstrating successful loss reduction measures and in educating citizens and officials on available flood hazard mitigation techniques.
- Avoided losses can be calculated and shown.

- **Areas of Significant Riverine or Coastal Erosion**

  Stream channels are shaped by a number of factors, including: degradation, aggradation, general scour, local scour, deposition, and lateral migration. Streams are constantly progressing towards a state of dynamic equilibrium involving water and sediment.

  Coastal shorelines erode in response to wave and water level conditions and other factors. As sea levels rise, erosion is typically exasperated.

  - **Reasons why areas of significant riverine or coastal erosion are considered AoMIs:**
    - Riverine flood damage assessments generally consider inundation alone
    - Bank erosion caused by within channel flows is not recognized as a significant hazard in Federal floodplain management regulations
    - Riverine and coastal erosion can undercut structures and roads, causing instability and possible collapse.
    - Landslides and mudslides are a result of erosion
    - Approximately one-third of the nation's streams experience severe erosion problems

- **Other**

  Other types of flood risk areas include drainage or stormwater-based flood hazard areas, or areas known to be inundated during storm events.

3 Flood Risk Analysis Results

The following pages provide summary flood risk results for the Flood Risk Project as follows:

- **Flood Risk Map.** Within the Flood Risk Project the FRM displays base data reflecting community boundaries, major roads, and stream lines; potential losses that include both the 2010 Average Annualized Loss (AAL) flood loss study supplemented with new Hazus runs for areas with new or updated flood modeling; new Flood Risk Project areas; and graphics and text that promote access and usage of additional data available through the FRD, FIRM, and National Flood Hazard Layer and viewers (desktop or FEMA website, etc.). This information can be used to assist in Flood Risk Project-level planning as well as for developing mitigation actions within each jurisdiction located within the Flood Risk Project.

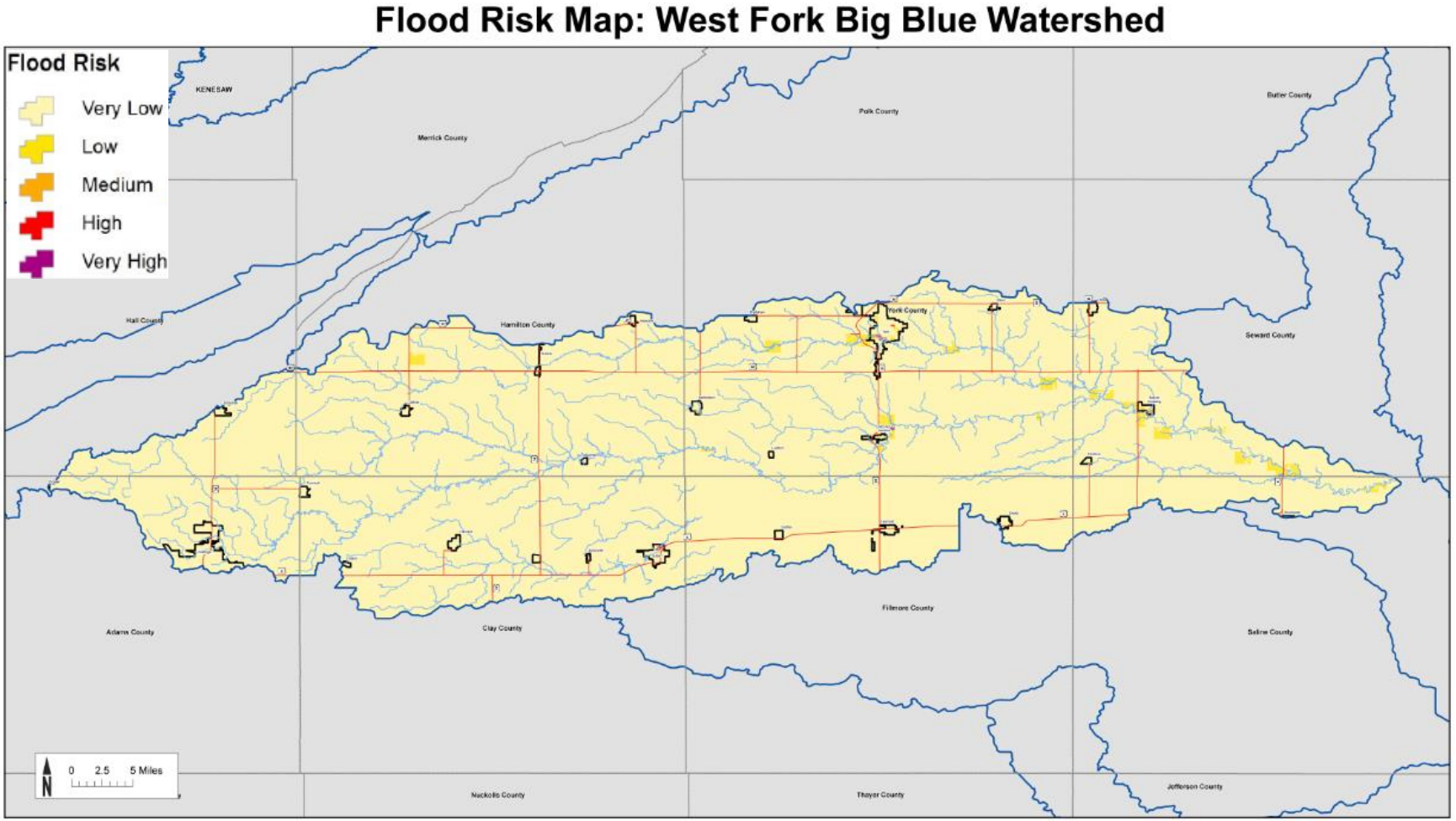
  The FRM provides a graphical overview of the Flood Risk Project which highlights areas of risk that should be noted, based on potential losses, exposed facilities, etc., based on data found in the FRD. Refer to the data in the FRD to conduct additional analyses.

- **Flood Risk Project Summary.** Within the Flood Risk Project area, summary data for some or all of the following datasets are provided for the entire project area and also on a jurisdiction by jurisdiction basis:
  - **Flood Depth and Analysis Grids.** A general discussion of the data provided in the FRD.
  - **Flood Risk Assessments.** A loss estimation of potential flood damages using different flood scenarios.

    Areas of Mitigation Interest. A description of areas that may benefit from mitigation or additional risk analysis.

3.1 Flood Risk Map

The Flood Risk Map for this Flood Risk Project is shown below. In addition to this reduced version of the map, a full size version is available within the FRD.



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3.2 West Fork Big Blue Flood Risk Project Area Summary

This flood risk assessment study encompasses the West Fork Big Blue watershed, which is spread out through south central Nebraska and covers all or part of the following counties: Adams, Clay, Fillmore, Hall, Hamilton, Saline, Seward, York.

3.2.1 Overview

The West Fork Big Blue Flood Risk Project located in Nebraska, includes the following communities:

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Adams County	310411	31,364	48%	82	15%	Y	10	Y
City of Aurora	310105	5,713	1%	0.31	11%	Y	10	Y
Village of Beaver Crossing	310208	403	100%	0.66	100%	Y	10	Y
Village of Bradshaw	310560	273	100%	0.28	100%	N	N/A	Y
Clay County	310425	6,542	55%	237	41%	Y	10	Y
Village of Cordova	310557	137	100%	0.19	100%	N	N/A	N
Village of Doniphan	310102	829	100%	0.49	96%	Y	10	Y
Village of Dorchester	310271	586	33%	0.11	23%	N	N/A	Y
Village of Exeter	310080	591	100%	0.62	100%	Y	10	Y
Village of Fairmont	310367	560	100%	0.82	100%	Y	10	Y
Fillmore County	310433	5,890	29%	155	27%	Y	10	Y
Village of Giltner	310278	352	100%	0.44	100%	N	N/A	Y
Village of Grafton	315609	126	100%	0.35	100%	N	N/A	Y
Hall County	310100	58,607	2%	63	11%	Y	10	Y
Hamilton County	310441	9,124	23%	275	51%	Y	10	Y
Village of Hampton	310546	423	100%	0.42	100%	N	N/A	Y
City of Harvard	310043	1,013	100%	0.64	100%	Y	10	Y
City of Hastings	310001	24,907	58%	7	49%	Y	10	Y
City of Henderson	310378	991	100%	0.64	100%	Y	10	Y
Village of Lushton	310562	30	100%	0.12	100%	N	N/A	N
Village of McCool Junction	310236	409	100%	0.47	100%	Y	10	Y
Village of Prosser	310566	66	17%	0.03	11%	N	N/A	Y
Saline County	310472	14,200	3%	57	10%	Y	10	Y

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Saronville	310568	47	100%	0.15	100%	N	N/A	Y
Seward County	310474	16,750	14%	130	23%	Y	10	Y
Village of Stockham	310106	44	100%	0.17	100%	N	N/A	Y
City of Sutton	310045	1,502	100%	1.69	100%	Y	10	Y
Village of Trumbull	310567	205	100%	0.42	100%	N	N/A	Y
Village of Utica	310402	861	100%	0.44	100%	N	N/A	Y
Village of Waco	310331	236	100%	0.24	100%	Y	10	Y
City of York	310237	13,665	100%	5.74	96%	Y	10	Y
York County	310486	13,665	89%	341	59%	Y	10	Y

Community-specific results are provided on subsequent pages. Data provided below and on subsequent pages only includes areas located within the West Fork Big Blue Flood Risk Project and do not necessarily represent community-wide totals.

Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.2.2 Flood Risk Datasets

As a part of this Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for this Flood Risk Project below:

- **Flood Depth and Analysis Grids**
    - The FRD contains datasets in the form of depth grids for the entire Flood Risk Project that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for

implementation. Section 2 of the FRR provides general information regarding the development of and potential uses for this data.

- **Flood Risk Results**
    - West Fork Big Blues's flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Potential losses were estimated as well as potential loss ratios for multiple scenarios. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

West Fork Big Blue: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$5,481,800,000	64%	$9,600,000	0%	$15,900,000	0%	$22,300,000	0%	$40,300,000	1%	$1,400,000	0%
Commercial Building & Contents	$1,795,700,000	21%	$5,900,000	0%	$8,000,000	0%	$11,400,000	1%	$20,600,000	1%	$800,000	0%
Other Building & Contents	$1,259,500,000	15%	$3,800,000	0%	$6,600,000	1%	$9,500,000	1%	$16,700,000	1%	$600,000	0%
Total Building & Contents[3]	$8,536,900,000	100%	$19,300,000	0%	$30,500,000	0%	$43,200,000	1%	$77,700,000	1%	$2,700,000	0%
Business Disruption[4]	N/A	N/A	$600,000	N/A	$1,000,000	N/A	$1,600,000	N/A	$2,700,000	N/A	$70,000	N/A
TOTAL[5]	**$8,536,900,000**	**N/A**	**$19,700,000**	**0%**	**$31,100,000**	**0%**	**$44,200,000**	**1%**	**$79,600,000**	**1%**	**$2,700,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

3.3 Communities

The following sections provide an overview of the community's floodplain management program as of the date of this publication, as well as summarize the flood risk analysis performed for each project area in Watershed USA.

3.3.1 Adams County Summary (CID 310411)

The following pages include Flood Risk data for Adams County.

3.3.1.1 Overview

Adams County is located in the southwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Adams County	310411	31,364	48%	82	15%	Y	10	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 10 policies totaling approximately $2,841,700
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in Adams County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.1.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):

- Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
- Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
- Percent annual chance of flooding grids
- Percent chance of flooding over a 30-year period grids

  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Adams County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Adams County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$2,195,600,000	64%	$90,000	0%	$200,000	0%	$200,000	0%	$300,000	0%	$10,000	0%
Commercial Building & Contents	$878,800,000	25%	$10,000	0%	$30,000	0%	$40,000	0%	$60,000	0%	$0	0%
Other Building & Contents	$372,600,000	11%	$40,000	0%	$70,000	0%	$90,000	0%	$100,000	0%	$0	0%
Total Building & Contents[3]	$3,447,000,000	100%	$100,000	0%	$300,000	0%	$300,000	0%	$500,000	0%	$20,000	0%
Business Disruption[4]	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$3,447,000,000**	**N/A**	**$100,000**	**0%**	**$300,000**	**0%**	**$300,000**	**0%**	**$600,000**	**0%**	**$20,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Debris Removal	2	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Enhance Floodplain Regulations	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
NFIP	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - Adams County intends to do a better job with the removal of trees and other debris from the Upper Little Blue and West Fork Big Blue channels as well as focusing on removing the debris that was left after the flooding in 2015. Local floodplain regulations will continue to be enforces for structures located in the 100-year floodplain. Adams County plans on continuing the National Flood Insurance Program (NFIP) and enforcing floodplain management requirements.

3.3.2 City of Hastings Summary (CID 310001)

The following pages include Flood Risk data for the City of Hastings.

3.3.2.1 Overview

The City of Hastings is located in Adams County in the southwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of Hastings	310001	24,907	58%	7	49%	Y	10	Y

- Participating in the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 21 policies totaling approximately $4,957,300
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the City of Hastings that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.2.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of Hastings's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

City of Hastings: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$2,104,700,000	64%	$10,000	0%	$20,000	0%	$20,000	0%	$30,000	0%	$0	0%
Commercial Building & Contents	$858,700,000	26%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$350,500,000	11%	$0	0%	$0	0%	$0	0%	$10,000	0%	$0	0%
Total Building & Contents[3]	$3,314,000,000	100%	$10,000	0%	$20,000	0%	$20,000	0%	$40,000	0%	$0	0%
Business Disruption[4]	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$3,314,000,000**	**N/A**	**$10,000**	**0%**	**$20,000**	**0%**	**$20,000**	**0%**	**$40,000**	**0%**	**$0**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Dam	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The City of Hastings would like to prevent flooding caused by overflow of their bodies of water and to promote general safety of all residents. In order to help achieve this goal, the City intends to repair or replace the Hastings Dam. This would reduce the likelihood of dam failure in the future.

3.3.3 Village of Prosser Summary (CID 310566)

The following pages include Flood Risk data for the Village of Prosser.

3.3.3.1 Overview

Adams County is located in Adams County and is in the far west tip of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Prosser	310566	66	17%	0.03	11%	N	N/A	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 7
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Prosser that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.3.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Prosser's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Prosser: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$4,600,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$0	0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$0	0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$4,600,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$4,600,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Join NFIP	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The Village of Prosser would like to complete floodplain mapping and enroll in the National Flood Insurance Program (NFIP) to improve risk awareness for residence and reduce flood impacts.

3.3.4 Clay County Summary (CID 310425)

The following pages include Flood Risk data for Clay County.

3.3.4.1 Overview

Clay County is located in the southwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Clay County	310425	6,542	55%	237	41%	Y	10	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 13 policies totaling approximately $6,791,500
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in Clay County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.4.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Clay County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Clay's County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$511,300,000	66%	$500,000	0%	$1,000,000	0%	$1,200,000	0%	$1,900,000	0%	$70,000	0%
Commercial Building & Contents	$104,000,000	13%	$100,000	0%	$400,000	0%	$500,000	0%	$900,000	1%	$20,000	0%
Other Building & Contents	$159,000,000	21%	$1,500,000	1%	$2,600,000	2%	$2,800,000	2%	$3,800,000	2%	$200,000	0%
Total Building & Contents[3]	$774,000,000	100%	$2,100,000	0%	$3,900,000	1%	$4,500,000	1%	$6,500,000	1%	$300,000	0%
Business Disruption[4]	N/A	N/A	$200,000	N/A	$300,000	N/A	$300,000	N/A	$400,000	N/A	$20,000	N/A
TOTAL[5]	**$774,000,000**	**N/A**	**$2,300,000**	**0%**	**$4,000,000**	**1%**	**$4,800,000**	**1%**	**$6,600,000**	**1%**	**$300,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Streamflow Constrictions	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
NFIP	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - In order to ensure public safety and promote commerce, Clay County would like to replace condemned Clay County Highway Department bridges. They would like to continue their participation in the National Flood Insurance Program (NFIP) and enforce floodplain management requirements including construction.

3.3.5 City of Harvard Summary (CID 310043)

The following pages include Flood Risk data for the City of Harvard.

3.3.5.1 Overview

The City of Harvard is located in Clay County the southwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of Harvard	310043	1,013	100%	0.64	100%	Y	10	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the City of Harvard that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.5.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of Harvard's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

City of Harvard: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$145,500,000	83%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$11,200,000	6%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$19,400,000	11%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$176,000,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$176,000,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Channel Improvements	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Ditch Cleanout/Drainage Improvement	2	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The City of Harvard would like to improve channels near creeks to reduce the likelihood of flooding events. They would also like to cleanout ditches to improve drainage issues community wide. They are especially working on the northwest and southeast quadrants of the community.

3.3.6 Village of Saronville Summary (CID 310568)

The following pages include Flood Risk data for the Village of Saronville.

3.3.6.1 Overview

The Village of Saronville is located in Clay County in the southwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Saronville	310568	47	100%	0.15	100%	N	N/A	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Saronville that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.6.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Saronville's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Saronville: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$4,500,000	43%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$1,800,000	17%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$4,200,000	40%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$10,500,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$10,500,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Improve Street Drainage	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Ditch Clearing	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The Village of Saronville will like to conduct improvements for drainage on their streets to reduce the likelihood of flooding on the village streets. They would also like to conduct ditch clearing and tree trimming to reduce the chances of flooding due to obstructed ditches.

3.3.7 City of Sutton Summary (CID 310045)

The following pages include Flood Risk data for the City of Sutton.

3.3.7.1 Overview

The City of Sutton is located in Clay County in the south central portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of Sutton	310045	1,502	100%	1.69	100%	Y	10	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 7 policies totaling approximately $495,100
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the City of Sutton that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.7.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of Sutton's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

City of Sutton: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$236,500,000	60%	$500,000	0%	$900,000	0%	$1,000,000	0%	$1,600,000	1%	$70,000	0%
Commercial Building & Contents	$65,000,000	17%	$90,000	0%	$300,000	0%	$400,000	1%	$800,000	1%	$20,000	0%
Other Building & Contents	$90,600,000	23%	$1,500,000	2%	$2,500,000	3%	$2,800,000	3%	$3,700,000	4%	$200,000	0%
Total Building & Contents[3]	$392,100,000	100%	$2,000,000	1%	$3,700,000	1%	$4,300,000	1%	$6,100,000	2%	$300,000	0%
Business Disruption[4]	N/A	N/A	$200,000	N/A	$300,000	N/A	$300,000	N/A	$400,000	N/A	$20,000	N/A
TOTAL[5]	**$392,100,000**	**N/A**	**$2,100,000**	**1%**	**$3,800,000**	**1%**	**$4,400,000**	**1%**	**$6,200,000**	**2%**	**$300,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Alert Sirens	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
NFIP Enforcement	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Flood-Prone Property Acquisition	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Levee Construction/Improvements	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The City of Sutton would like to install alert sirens to warn the public of dangerous weather. The City will continually be enforcing the floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs). Voluntary acquisition and demolition of properties prone to flooding, especially repetitive loss structures will be enforced to reduce the general threat to flooding for communities.
    - The City of Sutton would like to improve the existing levees and floodwalls, designed to FEMA standards to provide flood protection to businesses and residents during large storm events.

3.3.8 Village of Trumbull Summary (CID 310567)

The following pages include Flood Risk data for the Village of Trumbull.

3.3.8.1 Overview

The Village of Trumbull is located in Clay County in the western portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Trumbull	310567	205	100%	0.42	100%	N	N/A	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Trumbull that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.8.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Trumbull's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Trumbull: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$28,000,000	55%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$6,700,000	13%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$16,900,000	32%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$52,500,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$52,500,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
None Listed in Plan	N/A	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

3.3.9 Fillmore County Summary (CID 310433)

The following pages include Flood Risk data for Fillmore County.

3.3.9.1 Overview

Fillmore County is located in the southeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Fillmore County	310433	5,890	29%	155	27%	Y	10	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 3 policies totaling approximately $561,100
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in Fillmore County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.9.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Fillmore County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Fillmore County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$225,300,000	74%	$50,000	0%	$90,000	0%	$100,000	0%	$200,000	0%	$0	0%
Commercial Building & Contents	$36,700,000	12%	$0	0%	$10,000	0%	$80,000	0%	$200,000	0%	$0	0%
Other Building & Contents	$44,200,000	14%	$10,000	0%	$30,000	0%	$200,000	0%	$500,000	0%	$0	0%
Total Building & Contents[3]	$306,100,000	100%	$60,000	0%	$100,000	0%	$400,000	0%	$900,000	0%	$10,000	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$20,000	N/A	$50,000	N/A	$0	N/A
TOTAL[5]	**$306,100,000**	**N/A**	**$60,000**	**0%**	**$100,000**	**0%**	**$400,000**	**0%**	**$900,000**	**0%**	**$10,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Removal of Flow Constrictions	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The County of Fillmore would like to conduct a removal of flow constrictions which would reduce the likelihood of flood damage in the area.

3.3.10 Village of Exeter Summary (CID 310080)

The following pages include Flood Risk data for the Village of Exeter.

3.3.10.1 Overview

The Village of Exeter is located in the southeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Exeter	310080	591	100%	0.62	100%	Y	10	Y

- Participating in the County the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Exeter that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.10.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Exeter's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Exeter: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$63,200,000	69%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$14,900,000	16%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$13,600,000	15%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$91,700,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$91,700,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Pond Filling	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Educational Programs	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Drainage Improvement	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The Village of Exeter plans on filling a pond on the west side of the Village and conduct improvement of the drainage system in the southeast portion of the village to help prevent basement flooding. The Village would like to increase individual knowledge of all hazards through educational programs. These programs focus on keeping youth safe and to distribute information on black mold in flooded basements.

3.3.11 Village of Fairmont Summary (CID 310367)

The following pages include Flood Risk data for the Village of Fairmont.

3.3.11.1 Overview

The Village of Fairmont is located in Fillmore County in the southeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Exeter	310080	591	100%	0.62	100%	Y	10	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Fairmont that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.11.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Fairmont's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Fairmont: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$83,400,000	81%	N/A	N/A	N/A	N/A	N/A	N/A	$0	0%	$0	0%
Commercial Building & Contents	$9,000,000	9%	N/A	N/A	N/A	N/A	N/A	N/A	$0	0%	$0	0%
Other Building & Contents	$11,000,000	11%	N/A	N/A	N/A	N/A	N/A	N/A	$0	0%	$0	0%
Total Building & Contents[3]	$103,400,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	$0	0%	$0	0%
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$103,400,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**$0**	**0%**	**$0**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Storm Sewer Drainage	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Public Awareness/Education	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

  - The Village of Fairmont would like to develop a storm sewer drainage project to reduce flood impacts. Through activities and outreach projects the Village will increase public awareness of natural hazards to both public and private property owners and businesses.

3.3.12 Village of Grafton Summary (CID 315609)

The following pages include Flood Risk data for the Village of Grafton.

3.3.12.1 Overview

The Village of Grafton is located in Fillmore County in the south central portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Grafton	315609	126	100%	0.35	100%	N	N/A	Y

- Participating in the the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Grafton that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.12.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Grafton's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Grafton: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$26,000,000	89%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$0	0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$3,200,000	11%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$29,200,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$29,200,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Improve Drainage	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Public Awareness/Education	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The Village of Grafton would like to improve drainage at City Park to mitigate flood risk in the area. The village would also like to improve public awareness and education of natural hazards through outreach projects and distribution of maps to both private and public property owners and businesses.

3.3.13 Hall County Summary (CID 310100)

The following pages include Flood Risk data for Hall County.

3.3.13.1 Overview

Hall County is located in the the far west portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Hall County	310100	58,607	2%	63	11%	Y	10	Y

- Participating in the Hall County All-Hazards Mitigation Plan which expires 4/20/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 91 policies totaling approximately $7,797,900
- NFIP-recognized repetitive loss properties = 1 (Residential)
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in Hall County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.13.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Hall County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Hall County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$166,200,000	74%	$20,000	0%	$50,000	0%	$60,000	0%	$100,000	0%	$0	0%
Commercial Building & Contents	$33,300,000	15%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$26,500,000	12%	$0	0%	$10,000	0%	$20,000	0%	$30,000	0%	$0	0%
Total Building & Contents[3]	$226,100,000	100%	$30,000	0%	$60,000	0%	$70,000	0%	$100,000	0%	$0	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$226,100,000**	**N/A**	**$30,000**	**0%**	**$60,000**	**0%**	**$70,000**	**0%**	**$100,000**	**0%**	**$0**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Drainage Improvements	1	Hall County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Management/Control	2	Hall County Multi-Jurisdictional Hazard Mitigation Plan
Flood Awareness	1	Hall County Multi-Jurisdictional Hazard Mitigation Plan

    - Hall County would like to improve their drainage, especially in the flat portions of the county and the developed areas of Grand Island. They have been working on constructing detention basins west of the City. Flooding dynamics will continue to change as additional construction occurs around the fringes of existing development. Effective floodplain management is crucial. Every community within the county, including the county itself, participates in NFIP. Flood control and damage reduction is one of the primary responsibilities of the Central Platte NRD. The county would like to implement a flood awareness program to provide assistance and educational materials to the public.

3.3.14 Village of Doniphan Summary (CID 310102)

The following pages include Flood Risk data for the Village of Doniphan.

3.3.14.1 Overview

The Village of Doniphan is located in the southeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Doniphan	310102	829	100%	0.49	96%	Y	10	Y

- Participating in the Hall County All-Hazards Mitigation Plan which expires 4/20/2021
- Past Federal Disaster Declarations for flooding = 6
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Doniphan that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.14.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Doniphan's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Doniphan: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$110,600,000	76%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$26,300,000	18%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$8,500,000	6%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$146,400,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$146,400,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Maintain NFIP Status	1	Hall County Multi-Jurisdictional Hazard Mitigation Plan
Public Education	1	Hall County Multi-Jurisdictional Hazard Mitigation Plan

    - The Village of Doniphan would like to maintain good standing in NFIP by continuing to regulate development in the floodplain areas. They would also like to increase public education on potential natural hazards in the county.

3.3.15 Hamilton County Summary (CID 310441)

The following pages include Flood Risk data for Hamilton County.

3.3.15.1 Overview

Hamilton County is located in the northwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Hamilton County	310441	9,124	23%	275	51%	Y	10	Y

- Participating in the Hamilton County Multi-Jurisdictional Hazard Mitigation Plan Update which expires 8/14/2020
- Past Federal Disaster Declarations for flooding = 9
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 17 policies totaling approximately $2,513,000
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in Hamilton County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.15.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Hamilton County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Hamilton County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$303,300,000	64%	$700,000	0%	$1,300,000	0%	$1,700,000	1%	$2,900,000	1%	$100,000	0%
Commercial Building & Contents	$53,500,000	11%	$300,000	0%	$400,000	1%	$500,000	1%	$800,000	1%	$30,000	0%
Other Building & Contents	$115,300,000	24%	$300,000	0%	$600,000	1%	$800,000	1%	$1,300,000	1%	$40,000	0%
Total Building & Contents[3]	$472,200,000	100%	$1,200,000	0%	$2,300,000	0%	$2,900,000	1%	$5,000,000	1%	$200,000	0%
Business Disruption[4]	N/A	N/A	$20,000	N/A	$50,000	N/A	$80,000	N/A	$100,000	N/A	$0	N/A
TOTAL[5]	**$472,200,000**	**N/A**	**$1,300,000**	**0%**	**$2,400,000**	**1%**	**$3,000,000**	1%	**$5,100,000**	1%	**$200,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Public Awareness/Education	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional

    - Hamilton County would like to develop and provide information to residents and businesses about the types of hazards they are exposed to and their effects.

3.3.16 City of Aurora Summary (CID 310105)

The following pages include Flood Risk data for the City of Aurora.

3.3.16.1 Overview

The City of Aurora is located in Hamilton County in the northwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of Aurora	310105	5,713	1%	0.31	11%	Y	10	Y

- Participating in the Hamilton County Multi-Jurisdictional Hazard Mitigation Plan Update which expires 8/14/2020
- Past Federal Disaster Declarations for flooding = 9
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 5 policies totaling approximately $439,600
- NFIP-recognized repetitive loss properties = 1 (Residential)
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the City of Aurora that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.16.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of Aurora's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

City of Aurora: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$4,900,000	63%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Commercial Building & Contents	$100,000	1%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$2,800,000	36%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Total Building & Contents[3]	$7,800,000	100%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$7,800,000**	**N/A**	**$0**	**0%**	**$0**	**0%**	**$0**	**0%**	**$0**	**0%**	**$0**	0%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater/Drainage Improvements	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Drainage Study	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Floodplain Mapping/Management	2	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Floodplain Enforcements	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional

    - The City of Aurora would like to improve their stormwater system and do some drainage improvements to decrease stormwater runoff, improve retention and detention systems for managing stormwater runoff and prevent localized flooding. A drainage study can be conducted to identify and prioritize improvements to address site specific flooding and drainage problems. This will help prevent flooding by evaluating problem areas in order to improve drainage problems.
    - The City would like to update the existing floodplain maps for the county and communities that participate in NFIP. They will continue to enforce local floodplain regulations for structures located in the 100-year floodplain. This will protect from repetitive loss structures from flooding.

3.3.17 Village of Giltner Summary (CID 310278)

The following pages include Flood Risk data for the Village of Giltner.

3.3.17.1 Overview

The Village of Exeter is located in Hamilton County in the northwest portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Giltner	310278	352	100%	0.44	100%	N	N/A	Y

- Participating in the Hamilton County Multi-Jurisdictional Hazard Mitigation Plan Update which expires 8/14/2020
- Past Federal Disaster Declarations for flooding = 9
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Giltner that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.17.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Giltner's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Giltner: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$51,600,000	82%	$80,000	0%	$200,000	0%	$300,000	1%	$400,000	1%	$20,000	0%
Commercial Building & Contents	$5,500,000	9%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$6,000,000	10%	$10,000	0%	$30,000	0%	$40,000	1%	$50,000	1%	$0	0%
Total Building & Contents[3]	$63,100,000	100%	$80,000	0%	$200,000	0%	$300,000	0%	$400,000	1%	$20,000	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$63,100,000**	**N/A**	**$80,000**	**0%**	**$200,000**	**0%**	**$300,000**	**0%**	**$400,000**	**1%**	**$20,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Evacuation Plan	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Enroll in NFIP	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Public Awareness/Education	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional

  - The Village of Giltner is establishing a plan to effectively evacuate residents during storm events and major flooding. The Village would like to participate in the National Flood Insurance Program to enable property owners to purchase insurance protection against flood losses.
  - The Village of Giltner will continue to educate the public through activities such as outreach, distribution of maps, and environmental education to increase the awareness of natural hazards. They would like to increased knowledge to new comers and elderly about how to react when an event is occurring and to reduce damage to property to prevent loss of life and serious injury.

3.3.18 Village of Hampton Summary (CID 310546)

The following pages include Flood Risk data for the Village of Hampton.

3.3.18.1 Overview

The Village of Exeter is located in the southeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Hampton	310546	423	100%	0.42	100%	N	N/A	Y

- Participating in the Hamilton County Multi-Jurisdictional Hazard Mitigation Plan Update which expires 8/14/2020
- Past Federal Disaster Declarations for flooding = 9
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Hampton that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.18.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Hampton's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Hampton: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$63,600,000	67%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$16,400,000	17%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$14,300,000	15%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$94,300,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$94,300,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater Improvements	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Enroll in NFIP	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Public Awareness/Education	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional
Drainage Study	1	Hamilton County Update of Local Hazard Mitigation Plan Multi-Jurisdictional

  - The Village of Hampton wants to decrease the amount of runoff and improve retention and detention systems for managing stormwater runoff and prevent localized flooding. They want to enable property owners to purchase insurance protection against flood losses by participating in the national Flood Insurance Program (NFIP).
  - The Village of Hampton will continue to educate the public through activities such as outreach, distribution of maps, and environmental education to increase the awareness of natural hazards. They would like to increased knowledge to new comers and elderly about how to react when an event is occurring and to reduce damage to property to prevent loss of life and serious injury.
  - The Village of Hampton would like to help prevent flooding by evaluating the problem areas in order to improve drainage and flooding problems.

3.3.19 Village of Stockham Summary (CID 310106)

The following pages include Flood Risk data for the Village of Stockham.

3.3.19.1 Overview

The Village of Stockham is located in Hamilton County in the west central portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Stockham	310106	44	100%	0.17	100%	N	N/A	Y

- Participating in the Hamilton County Multi-Jurisdictional Hazard Mitigation Plan Update which expires 8/14/2020
- Past Federal Disaster Declarations for flooding = 9
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Stockham that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.19.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Stockham's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Stockham: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$6,700,000	79%	$0	0%	$10,000	0%	$30,000	0%	$400,000	6%	$0	0%
Commercial Building & Contents	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$1,800,000	21$	$0	0%	$0	0%	$0	0%	$100,000	7%	$0	0%
Total Building & Contents[3]	$8,500,000	100%	$0	0%	$10,000	0%	$30,000	0%	$500,000	6%	$0	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$10,000	N/A	$0	N/A
TOTAL[5]	**$8,500,000**	**N/A**	**$0**	**0%**	**$10,000**	**0%**	**$30,000**	**0%**	**$500,000**	**6%**	**$0**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

3.3.20 Saline County Summary (CID 310472)

The following pages include Flood Risk data for Saline County.

3.3.20.1 Overview

Saline County is located in the southeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Saline County	310472	14,200	3%	57	10%	Y	10	Y

- Participating in the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 10
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 20 policies totaling approximately $1,925,000
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

includes areas in Saline County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.20.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Saline County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Saline County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$81,800,000	80%	$100,000	0%	$200,000	0%	$300,000	0%	$400,000	1%	$20,000	0%
Commercial Building & Contents	$4,400,000	4%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$15,800,000	16%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Total Building & Contents[3]	$101,900,000	100%	$100,000	0%	$200,000	0%	$300,000	0%	$400,000	0%	$20,000	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$101,900,000**	**N/A**	**$100,000**	**0%**	**$200,000**	**0%**	**$300,000**	**0%**	**$400,000**	**0%**	**$20,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Warning System	5	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Improve Flood Warning System	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

  - Saline County would like to obtain an outdoor warning siren at Swan Lake, Alert sirens at Blue River Lodge in Crete, a Tri-County Emergency Reverse Notification System, and inventory weather radios at schools and other critical facilities, to warn the public of dangerous weather and public emergencies.

3.3.21 Village of Dorchester Summary (CID 310271)

The following pages include Flood Risk data for the Village of Dorchester.

3.3.21.1 Overview

The Village of Exeter is located in the southeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Dorchester	310271	586	33%	0.11	23%	N	N/A	Y

- Participating in the Lower Big Blue and Little Blue Natural Resources Districts Multi-Hazard Mitigation Plan which expires 5/06/2021
- Past Federal Disaster Declarations for flooding = 10
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Dorchester that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.21.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Dorchester's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Dorchester: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$37,100,000	70%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$2,700,000	5%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$13,100,000	25%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$52,800,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$52,800,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Outdoor Warning Device Upgrades	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Safe Zoning Ordinance	1	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan
Increase Public Awareness	2	Lower Big Blue and Little Blue Natural Resources Districts All-Hazards Mitigation Plan

    - The Village of Dorchester would like to conduct an upgrade of the outdoor warning devices to warn public of severe weather. The Village is considering modifying zoning ordinances to discourage future development from occurring in hazardous areas. They would like to increase public awareness through activities and outreach in regards to natural hazards to increase knowledge to the citizens.

3.3.22 Seward County Summary (CID 310474)

The following pages include Flood Risk data for Seward County.

3.3.22.1 Overview

Seward County is located in the eastern portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Seward County	310474	16,750	14%	130	23%	Y	10	Y

- Participating in the Seward County Multi-Jurisdictional Hazard Mitigation Plan which expires 10/27/2019
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 14 policies totaling approximately $1,479,000
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in Seward County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.22.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - Seward County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Seward County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$283,900,000	63%	$2,400,000	1%	$3,700,000	1%	$4,400,000	2%	$10,000,000	4%	$300,000	0%
Commercial Building & Contents	$59,900,000	13%	$2,700,000	4%	$2,900,000	5%	$3,000,000	5%	$4,100,000	7%	$300,000	0%
Other Building & Contents	$107,800,000	24%	$500,000	1%	$900,000	1%	$1,100,000	1%	$2,400,000	2%	$80,000	0%
Total Building & Contents[3]	$451,500,000	100%	$5,600,000	1%	$7,500,000	2%	$8,500,000	2%	$16,500,000	4%	$700,000	0%
Business Disruption[4]	N/A	N/A	$200,000	N/A	$200,000	N/A	$200,000	N/A	$400,000	N/A	$20,000	N/A
TOTAL[5]	**$451,500,000**	**N/A**	**$5,800,000**	**1%**	**$7,700,000**	**2%**	**$8,600,000**	**2%**	**$16,800,000**	**4%**	**$700,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stream Bank Stabilization	2	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Remove flow restrictions	1	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Stormwater/Drainage Improvements	3	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Mapping/Regulations	2	Seward County Multi-Jurisdictional Hazard Mitigation Plan

    - In Seward County stream bank degradation has occurred along many rivers and creeks. Implementing stabilization improvements to reestablish channel banks can increase conveyance and provide flooding benefits. The county would also benefit from conducting a preliminary drainage assessment and design bridge improvements to reduce or alleviate flooding. Many communities in Seward County utilize underground stormwater systems to convey runoff. System improvements will serve to effectively convey runoff within the cities and villages. Drainage ditches and culverts that convey runoff could also be improved in smaller communities.
    - Updated floodplain mapping is something that most communities in Seward County who participate in NFIP, could benefit from. This would allow communities to better identify flood threats.

3.3.23 Village of Beaver Crossing Summary (CID 310208)

The following pages include Flood Risk data for the Village of Beaver Crossing.

3.3.23.1 Overview

The Village of Beaver Crossing is located in Seward County in the eastern portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Beaver Crossing	310208	403	100%	0.66	100%	Y	10	Y

- Participating in the Seward County Multi-Jurisdictional Hazard Mitigation Plan which expires 10/27/2019
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = policy totaling approximately $96,400
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Beaver Crossing that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.23.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Village of Beaver Crossing's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Beaver Crossing: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$40,800,000	69%	$900,000	2%	$1,400,000	3%	$1,600,000	4%	$6,000,000	15%	$100,000	0%
Commercial Building & Contents	$10,200,000	17%	$100,000	1%	$200,000	2%	$200,000	2%	$1,200,000	12%	$20,000	0%
Other Building & Contents	$8,200,000	14%	$200,000	2%	$300,000	3%	$300,000	4%	$1,200,000	15%	$30,000	0%
Total Building & Contents[3]	$59,100,000	100%	$1,200,000	2%	$1,800,000	3%	$2,100,000	4%	$8,400,000	14%	$200,000	0%
Business Disruption[4]	N/A	N/A	$10,000	N/A	$20,000	N/A	$20,000	N/A	$200,000	N/A	$0	N/A
TOTAL[5]	**$59,100,000**	**N/A**	**$1,200,000**	**2%**	**$1,800,000**	**3%**	**$2,100,000**	**4%**	**$8,500,000**	**14%**	**$200,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stream Bank Stabilization	2	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Remove flow restrictions	1	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Stormwater/Drainage Improvements	2	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Mapping/Regulations	2	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Evacuation Plan	1	Seward County Multi-Jurisdictional Hazard Mitigation Plan

    - The Village of Beaver Crossing would like to implement stabilization improvements to reestablish channel banks can increase conveyance and provide flooding benefits. The Village would also benefit from conducting a preliminary drainage assessment and design bridge improvements to reduce or alleviate flooding. The Village utilizes underground stormwater systems to convey runoff. System improvements will serve to effectively convey runoff within the village. Drainage ditches and culverts that convey runoff could also be improve.
    - Updated floodplain mapping is something that the Village of Beaver Crossing could benefit from, allowing them better identify flood threats. The Village would like to establish a plan to effectively evacuate rural residents in the event of a storm or flooding.

3.3.24 Village of Cordova Summary (CID 310557)

The following pages include Flood Risk data for the Village of Cordova.

3.3.24.1 Overview

The Village of Cordova is located in Seward County in the eastern portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Cordova	310557	137	100%	0.19	100%	N	N/A	N

- Participating in the Seward County Multi-Jurisdictional Hazard Mitigation Plan which expires 10/27/2019
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Cordova that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.24.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Cordova's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Cordova: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$16,600,000	71%	$0	0%	$10,000	0%	$20,000	0%	$50,000	0%	$0	0%
Commercial Building & Contents	$4,000,000	17%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$2,700,000	12%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Total Building & Contents[3]	$23,400,000	100%	$0	0%	$10,000	0%	$20,000	0%	$50,000	0%	$0	0%
Business Disruption[4]	$N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$23,400,000**	**N/A**	**$0**	**0%**	**$10,000**	**0%**	**$20,000**	**0%**	**$50,000**	**0%**	**$0**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

3.3.25 Village of Utica Summary (CID 310402)

The following pages include Flood Risk data for the Village of Utica.

3.3.25.1 Overview

The Village of Utica is located in Seward County in the northeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Utica	310402	861	100%	0.44	100%	N	N/A	Y

- Participating in the Seward County Multi-Jurisdictional Hazard Mitigation Plan which expires 10/27/2019
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Utica that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.25.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids

    - Percent chance of flooding over a 30-year period grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Village of Exeter's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Utica: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$134,500,000	59%	N/A	N/A	N/A	N/A	$20,000	0%	$90,000	0%	$0	0%
Commercial Building & Contents	$32,300,000	14%	N/A	N/A	N/A	N/A	$0	0%	$10,000	0%	$0	0%
Other Building & Contents	$61,400,000	27%	N/A	N/A	N/A	N/A	$0	0%	$10,000	0%	$0	0%
Total Building & Contents[3]	$228,100,000	100%	N/A	N/A	N/A	N/A	$20,000	0%	$100,000	0%	$0	0%
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$0	N/A	$10,000	N/A	$0	N/A
TOTAL[5]	**$228,100,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**$20,000**	**0%**	**$100,000**	**0%**	**$0**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Levee Improvements	1	Seward County Multi-Jurisdictional Hazard Mitigation Plan
Stream Bank Stabilization	1	Seward County Multi-Jurisdictional Hazard Mitigation Plan

    - The Village of Utica would like to conduct levee improvements to provide flood protection to businesses and residents during large storm events. There has been stream bank degradation within the village along many rivers and creeks. Streambank stabilization improvements would be beneficial.

3.3.26 York County Summary (CID 310486)

The following pages include Flood Risk data for York County.

3.3.26.1 Overview

York County is located in the northeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
York County	310486	13,665	89%	341	59%	Y	10	Y

- Participating in the York County Multi-Jurisdictional Hazard Mitigation Plan which expires 9/11/2020
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 14 policies totaling approximately $2,102,700
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in York County that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.26.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - York County's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

York County: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$1,693,600,000	62%	$5,700,000	0%	$9,200,000	1%	$14,400,000	1%	$24,500,000	1%	$800,000	0%
Commercial Building & Contents	$620,700,000	23%	$2,900,000	0%	$4,300,000	1%	$7,300,000	1%	$14,600,000	2%	$400,000	0%
Other Building & Contents	$407,100,000	15%	$1,400,000	0%	$2,400,000	1%	$4,500,000	1%	$8,600,000	2%	$200,000	0%
Total Building & Contents[3]	$2,721,400,000	100%	$9,900,000	0%	$16,000,000	1%	$26,200,000	1%	$47,700,000	2%	$1,500,000	0%
Business Disruption[4]	N/A	N/A	$200,000	N/A	$400,000	N/A	$900,000	N/A	$1,700,000	N/A	$30,000	N/A
TOTAL[5]	**$2,721,400,000**	**N/A**	**$10,100,000**	**0%**	**$16,300,000**	**1%**	**$26,900,000**	**1%**	**$49,100,000**	**2%**	**$1,500,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater System and Drainage Improvements	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Stream Bank Stabilization	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Drainage Study	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Property Acquisition	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Regulation/Enforcement/Management	2	York County Multi-Jurisdictional Hazard Mitigation Plan
Participate in NFIP	1	York County Multi-Jurisdictional Hazard Mitigation Plan

    - In York County many communities utilize underground stormwater systems while smaller communities utilize ditches, culverts and drainage ponds. Stormwater system improvements will be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements. Stream bank degradation has occurred along many rivers and creeks. Improvements can be implemented to reestablish the channel banks. York County would like to conduct drainage studies and assessments to create stormwater master plans that will help in identifying stormwater problem areas and potential drainage improvements.
    - York County would like to implement voluntary acquisition and demolition of properties prone to flooding and reduce the general threat of flooding to communities within the county. The county will also continue to enforce local floodplain regulations for structures located in the 1-percent annual chance floodplain. A good standing with the National Flood Insurance Program (NFIP) is important to York County.

3.3.27 Village of Bradshaw Summary (CID 310560)

The following pages include Flood Risk data for the Village of Bradshaw.

3.3.27.1 Overview

The Village of Bradshaw is located in York County the north central portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Bradshaw	310560	273	100%	0.28	100%	N	N/A	Y

- Participating in the York County Multi-Jurisdictional Hazard Mitigation Plan which expires 9/11/2020
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Bradshaw that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.27.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Exeter's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Bradshaw: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$50,600,000	77%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$6,900,000	11%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$8,100,000	12%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$65,600,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$65,600,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater System and Drainage Improvements	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Stream Bank Stabilization	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Drainage Study	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Property Acquisition	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Regulation/Enforcement	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Participate in NFIP	1	York County Multi-Jurisdictional Hazard Mitigation Plan

    - The Village of Bradshaw utilizes ditches, culverts and drainage ponds. Stormwater system improvements will be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements. Stream bank degradation has occurred along many rivers and creeks. Improvements can be implemented to reestablish the channel banks. The Village of Bradshaw would like to conduct drainage studies and assessments to create stormwater master plans that will help in identifying stormwater problem areas and potential drainage improvements.
    - The Village of Bradshaw would like to implement voluntary acquisition and demolition of properties prone to flooding and reduce the general threat of flooding to communities within the county. The county will also continue to enforce local floodplain regulations for structures located in the 1-percent annual chance floodplain. A good standing with the National Flood Insurance Program (NFIP) is important to the Village of Bradshaw.

3.3.28 City of Henderson Summary (CID 310378)

The following pages include Flood Risk data for the City of Henderson.

3.3.28.1 Overview

The City of Henderson is located in York County in the central portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of Henderson	310378	991	100%	0.64	100%	Y	10	Y

- Participating in the York County Multi-Jurisdictional Hazard Mitigation Plan which expires 9/11/2020
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the City of Henderson that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.28.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The City of Henderson's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

City of Henderson: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$126,600,000	47%	$200,000	0%	$300,000	0%	$300,000	0%	$400,000	0%	$20,000	0%
Commercial Building & Contents	$49,400,000	18%	$10,000	0%	$10,000	0%	$10,000	0%	$20,000	0%	$0	0%
Other Building & Contents	$93,200,000	35%	$80,000	0%	$100,000	0%	$100,000	0%	$200,000	0%	$10,000	0%
Total Building & Contents[3]	$269,200,000	100%	$200,000	0%	$400,000	0%	$400,000	0%	$600,000	0%	$30,000	0%
Business Disruption[4]	N/A	N/A	$10,000	N/A	$10,000	N/A	$10,000	N/A	$10,000	N/A	$0	N/A
TOTAL[5]	**$269,200,000**	**N/A**	**$200,000**	**0%**	**$400,000**	**0%**	**$500,000**	**0%**	**$600,000**	**0%**	**$30,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater System and Drainage Improvements	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Stream Bank Stabilization	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Drainage Study	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Property Acquisition	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Regulation/Enforcement	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Participate in NFIP	1	York County Multi-Jurisdictional Hazard Mitigation Plan

  - The City of Henderson plans regular maintenance for Main, Elm, Oak and Ash Streets to decrease runoff rates while also decreasing the need for other stormwater system improvements. Stream bank degradation has occurred along many rivers and creeks. Improvements can be implemented to reestablish the channel banks. The City of Henderson would like to conduct drainage studies and assessments to create stormwater master plans that will help in identifying stormwater problem areas and potential drainage improvements.
  - The City of Henderson would like to implement voluntary acquisition and demolition of properties prone to flooding and reduce the general threat of flooding to communities within the county. The city will also continue to enforce local floodplain regulations for structures located in the 1-percent annual chance floodplain. A good standing with the National Flood Insurance Program (NFIP) is important to the City of Henderson.

3.3.29 Village of Lushton Summary (CID 310562)

The following pages include Flood Risk data for the Village of Lushton.

3.3.29.1 Overview

The Village of Lushton is located in York County in the central portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Lushton	310562	30	100%	0.12	100%	N	N/A	N

- Participating in the York County Multi-Jurisdictional Hazard Mitigation Plan which expires 9/11/2020
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Lushton that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.29.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**

  - The Village of Lushton's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Lushton: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$6,500,000	84%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building & Contents	$500,000	6%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building & Contents	$800,000	10%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building & Contents[3]	$7,700,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	**$7,700,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

3.3.30 Village of McCool Junction Summary (CID 310236)

The following pages include Flood Risk data for the Village of McCool Junction.

3.3.30.1 Overview

The Village of McCool Junction is located in York County in the east central portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of McCool Junction	310236	409	100%	0.47	100%	Y	10	Y

- Participating in the York County Multi-Jurisdictional Hazard Mitigation Plan which expires 9/11/2020
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 10 policies totaling approximately $1,424,300
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of McCool Junction that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.30.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)

    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Village of McCool Junction's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of McCool Junction: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$60,400,000	74%	$50,000	0%	$100,000	0%	$200,000	0%	$1,300,000	2%	$10,000	0%
Commercial Building & Contents	$10,300,000	13%	$10,000	0%	$20,000	0%	$20,000	0%	$400,000	4%	$0	0%
Other Building & Contents	$11,100,000	14%	$10,000	0%	$20,000	0%	$20,000	0%	$300,000	3%	$0	0%
Total Building & Contents[3]	$81,700,000	100%	$70,000	0%	$200,000	0%	$200,000	0%	$2,000,000	2%	$20,000	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$50,000	N/A	$0	N/A
TOTAL[5]	**$81,700,000**	**N/A**	**$70,000**	**0%**	**$200,000**	**0%**	**$200,000**	**0%**	**$2,000,000**	**2%**	**$20,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater System and Drainage Improvements	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Stream Bank Stabilization	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Property Acquisition	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Regulation/Enforcement	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Participate in NFIP	1	York County Multi-Jurisdictional Hazard Mitigation Plan

    - The Village of McCool Junction utilizes ditches and culverts to convey runoff. Improvements will help to decrease runoff rates while also decreasing the need for other stormwater system improvements. Stream bank degradation has occurred along many rivers and creeks. Improvements can be implemented to reestablish the channel banks.
    - The Village of McCool Junction would like to implement voluntary acquisition and demolition of properties prone to flooding and reduce the general threat of flooding to communities within the county. The village will also continue to enforce local floodplain regulations for structures located in the 1-percent annual chance floodplain. A good standing with the National Flood Insurance Program (NFIP) is important to the Village of McCool Junction.

3.3.31 Village of Waco Summary (CID 310331)

The following pages include Flood Risk data for the Village of Waco.

3.3.31.1 Overview

The Village of Waco is located in York County in the northeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
Village of Waco	310331	236	100%	0.24	100%	Y	10	Y

- Participating in the York County Multi-Jurisdictional Hazard Mitigation Plan which expires 9/11/2020
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies totaling approximately $0
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the Village of Waco that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.31.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The Village of Waco's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

Village of Waco: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$39,100,000	62%	$20,000	0%	$30,000	0%	$40,000	0%	$60,000	0%	$0	0%
Commercial Building & Contents	$10,500,000	17%	$0	0%	$0	0%	$0	0%	$0	0%	$0	0%
Other Building & Contents	$13,600,000	22%	$0	0%	$10,000	0%	$10,000	0%	$20,000	0%	$0	0%
Total Building & Contents[3]	$63,200,000	100%	$20,000	0%	$50,000	0%	$60,000	0%	$80,000	0%	$0	0%
Business Disruption[4]	N/A	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A	$0	N/A
TOTAL[5]	**$63,200,000**	**N/A**	**$20,000**	**0%**	**$50,000**	**0%**	**$60,000**	**0%**	**$80,000**	**0%**	**$0**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater System and Drainage Improvements	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Stream Bank Stabilization	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Drainage Study	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Property Acquisition	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Regulation/Enforcement	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Participate in NFIP	1	York County Multi-Jurisdictional Hazard Mitigation Plan

    - The Village of Waco utilizes ditches and culverts to convey runoff. Improvements will help to decrease runoff rates while also decreasing the need for other stormwater system improvements. Stream bank degradation has occurred along many rivers and creeks. Improvements can be implemented to reestablish the channel banks. The Village of Waco would like to conduct drainage studies and assessments to create stormwater master plans that will help in identifying stormwater problem areas and potential drainage improvements.
    - The Village of Waco would like to implement voluntary acquisition and demolition of properties prone to flooding and reduce the general threat of flooding to the village. The village will also continue to enforce local floodplain regulations for structures located in the 1-percent annual chance floodplain. A good standing with the National Flood Insurance Program (NFIP) is important to the Village of Waco.

3.3.32 City of York Summary (CID 310237)

The following pages include Flood Risk data for the City of York.

3.3.32.1 Overview

The City of York is located in the northeast portion of the watershed. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population	Percent of Population in Watershed	Total Community Land Area (sq mi)	Percent of Land Area in Watershed	NFIP	CRS Rating	Mitigation Plan
City of York	310237	13,665	100%	5.74	96%	Y	10	Y

- Participating in the York County Multi-Jurisdictional Hazard Mitigation Plan which expires 9/11/2020
- Past Federal Disaster Declarations for flooding = 8
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 44 policies totaling approximately $4,204,400
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas in the City of York that are located within the West Fork Big Blue Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the FRR provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the FRD.

3.3.32.2 Community Analyses and Results

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - Water surface elevation grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Multi-frequency flood depth grids (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events)
    - Percent annual chance of flooding grids
    - Percent chance of flooding over a 30-year period grids

- Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.

- **Flood Risk Results**
  - The City of York's flood risk analysis uses results from a FEMA-performed Hazus analysis which accounts for newly modeled areas in the Flood Risk Project and newly modeled depths for certain flood events. Additional information and data layers provided within the FRD should be used to further analyze potential losses and areas where they are likely to occur.

City of York: Estimated Potential Losses for Flood Event Scenarios

Type	Inventory Estimated Value	% of Total	10% (10-yr) Dollar Losses[1]	10% Loss Ratio[2]	2% (50-yr) Dollar Losses[1]	2% Loss Ratio[2]	1% (100-yr) Dollar Losses[1]	1% Loss Ratio[2]	0.2% (500-yr) Dollar Losses[1]	0.2% Loss Ratio[2]	Annualized Losses[1] ($/yr)	Ann. Loss Ratio[2]
Residential Building & Contents	$1,094,100,000	62%	$1,500,000	0%	$2,900,000	0%	$6,400,000	1%	$12,000,000	1%	$300,000	0%
Commercial Building & Contents	$485,500,000	27%	$2,500,000	0%	$3,600,000	0%	$6,400,000	1%	$12,800,000	3%	$400,000	0%
Other Building & Contents	$189,900,000	11%	$600,000	1%	$800,000	1%	$1,900,000	1%	$3,100,000	2%	$90,000	0%
Total Building & Contents[3]	$1,769,500,000	100%	$4,600,000	0%	$7,300,000	0%	$14,700,000	1%	$27,900,000	2%	$700,000	0%
Business Disruption[4]	N/A	N/A	$200,000	N/A	$300,000	N/A	$600,000	N/A	$1,000,000	N/A	$20,000	N/A
TOTAL[5]	**$1,769,500,000**	**N/A**	**$4,800,000**	**0%**	**$7,600,000**	**0%**	**$15,000,000**	**1%**	**$28,600,000**	**2%**	**$800,000**	**0%**

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total = Total Building and Contents + Business Disruption

The figures in this table only represent information within the West Fork Big Blue

- **Areas of Mitigation Interest**
    - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	*Number of Occurrences*	*Data Source*
Stormwater System and Drainage Improvements	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Stream Bank Stabilization	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Property Acquisition	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Floodplain Regulation/Enforcement	1	York County Multi-Jurisdictional Hazard Mitigation Plan
Participate in NFIP	1	York County Multi-Jurisdictional Hazard Mitigation Plan

    - The City of York utilizes underground stormwater systems to convey runoff. Improvements will help to decrease runoff rates while also decreasing the need for other stormwater system improvements. Stream bank degradation has occurred along many rivers and creeks. Improvements can be implemented to reestablish the channel banks.
    - The City of York would like to implement voluntary acquisition and demolition of properties prone to flooding and reduce the general threat of flooding to the city. The city will also continue to enforce local floodplain regulations for structures located in the 1-percent annual chance floodplain. A good standing with the National Flood Insurance Program (NFIP) is important to the City of York.

4 Actions to Reduce Flood Risk

In order to fully leverage the Flood Risk Datasets and Products created for this Flood Risk Project, local stakeholders should consider many different flood risk mitigation tactics, including, but not limited the items shown in the sub-sections below.

Before Mitigation and After Mitigation





Communities will need to prioritize projects as part of the planning process. FEMA can then help route federal mitigation dollars to fund these projects.

4.1 Types of Mitigation Actions

Mitigation provides a critical foundation on which to reduce loss of life and property by avoiding or lessening the impact of hazard events. This creates safer communities and facilitates resiliency by enabling communities to return to normal function as quickly as possible after a hazard event. Once a community understands its flood risk, it is in a better position to identify potential mitigation actions that can reduce the risk to its people and property.

The mitigation plan requirements in 44 CFR Part 201 encourage communities to understand their vulnerability to hazards and take actions to minimize vulnerability and promote resilience. Flood mitigation actions generally fall into the following categories:

4.1.1 Preventative Measures

Preventative measures are intended to keep flood hazards from getting worse. They can reduce future vulnerability to flooding, especially in areas where development has not yet occurred or where capital improvements have not been substantial. Examples include:

- Comprehensive land use planning
- Zoning regulations
- Subdivision regulations
- Open space preservation
- Building codes
- Floodplain development regulations
- Stormwater management

NFIP's CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the CRS: to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance.

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount. (A Class 10 is not participating in the CRS and receives no discount.)

- Purchase development rights or conservation easements
- Participation in the NFIP Community Rating System (CRS)

4.1.2 Property Protection Measures

Property protection measures protect existing buildings by modifying the building to withstand floods, erosion, and waves or by removing buildings from hazardous locations. Examples include:

- Building relocation
- Acquisition and clearance
- Building elevation
- Barrier installation
- Building retrofit

4.1.3 Natural Resource Protection Activities

Natural resource protection activities reduce the impact of floods by preserving or restoring natural areas such as floodplains, wetlands, and dunes and their natural functions. Examples include:

- Wetland protection
- Habitat protection
- Erosion and sedimentation control
- Best management practices (BMP)
- Prevention of stream dumping activities (anti-litter campaigns)
- Improved forestry practices such as reforesting or selective timbering (extraction)
- Beach Nourishment
- Dune Construction
- Dune protection measures such as walkovers, sand fencing, and vegetation

4.1.4 Structural Mitigation Projects

Structural mitigation projects lessen the impact of floods by modifying the environmental natural progression of the flooding event. Structural protection such as upgrading dams/levees for already existing development and critical facilities may be a realistic alternative. However, citizens should be made aware of their residual risk. Examples include:

- Reservoirs, retention, and detention basins

- Levees and floodwalls
- Channel modifications
- Channel maintenance
- Seawalls, reventments, and bulkheads
- Groins, offshore breakwaters, and jetties

4.1.5 Public Education and Awareness Activities

Public education and awareness activities advise residents, business owners, potential property buyers, and visitors about floods, hazardous areas, and mitigation techniques they can use to reduce the flood risk to themselves and their property. Examples include:

- Readily available and readable updated maps
- Outreach projects
- Libraries
- Technical assistance
- Real estate disclosure
- Environmental education
- Risk information via the nightly news

For more information regarding hazard mitigation techniques, best practices, and potential grant funding sources, visit www.fema.gov or contact your local floodplain manager, emergency manager, or State Hazard Mitigation Officer.

4.1.6 Emergency Service Measures

Although not typically considered a mitigation technique, emergency service measures minimize the impact of flooding on people and property. These are actions commonly taken immediately prior to, during, or in response to a hazard event. Examples include:

- Hazard warning system
- Emergency response plan
- COOP and COG planning
- Critical facilities protection
- Health and safety maintenance
- Post flood recovery planning

In Section 3, specific Areas of Mitigation Interest were identified. Table 4.1 below identifies possible mitigation actions for each AoMI to consider.

Table 4-1. Mitigation Actions for Areas of Mitigation Interest

AoMI	Possible Actions to Reduce Flood Risk
Dams	• Engineering assessment • Dam upgrades and strengthening • Emergency Action Plan • Dam removal • Easement creation in impoundment and downstream inundation areas
Levees (accredited and non-accredited) and significant levee-like structures	• Generally same as dams above • Purchase of flood insurance for at-risk structures
Coastal Structures • Jetties • Groins • Seawalls • Other structures	• Increase coastal setbacks for construction • Habitat restoration programs • Wetland restoration and mitigation banking programs • Engineering assessment • Structure upgrades and strengthening • Emergency Action Plan • Structure removal
Stream Flow Constrictions (Undersized culverts or bridge openings)	• Engineering analysis • Replacement of structure pre- and post-disaster
Past Flood Insurance Claims and IA/PA Hot Spots	• Acquisition • Elevation • Relocation • Floodproofing
Significant Land Use Changes	• Higher regulatory standard • Stormwater BMPs • Transfer of Development rights • Compensatory storage and equal conveyance standards
Key Emergency Routes Overtopped During Frequent Flooding Events	• Elevation • Creation of alternate routes • Design as low water crossing

AoMI	Possible Actions to Reduce Flood Risk
Areas of Significant Riverine or Coastal Erosion	• ***Relocation of buildings and infrastructure*** • ***Regulations and planning*** • ***Natural vegetation*** • ***Erosion Control Structures*** • ***Building Setbacks*** • ***Beach Nourishment*** • ***Dune Construction*** • ***Dune Protection Activities***
Drainage or Stormwater-Based Flood Hazard Areas, or Areas Not Identified as Floodprone on the FIRM but Known to be Inundated	• ***Identification of all flood hazard areas***
Areas of Mitigation Success	***N/A***

4.2 Identifying Specific Actions for Your Community

As many mitigation actions are possible to lessen the impact of floods, how can a community decide which ones are appropriate to implement? There are many ways to identify specific actions most appropriate for a community. Some factors to consider may include the following:

Refer to FEMA Mitigation Planning How To Guide #3 (FEMA 386-3) "Developing the Mitigation Plan - Identifying Mitigation Actions and Implementation Strategies" for more information on how to identify specific mitigation actions to address hazard risk in your community.

- **Site characteristics.** Does the site present unique challenges (e.g., significant slopes or erosion potential)?
- **Flood characteristics.** Are the flood waters affecting the site fast or slow moving? Are there wave hazards? Is there debris associated with the flow? How deep is the flooding?
- **Social acceptance.** Will the mitigation action be acceptable to the public? Does it cause social or cultural problems?
- **Technical feasibility.** Is the mitigation action technically feasible (e.g., making a building watertight to a reasonable depth)?
- **Administrative feasibility.** Is there administrative capability to implement the mitigation action?
- **Legal.** Does the mitigation action meet all applicable codes, regulations, and laws? Public officials may have a legal responsibility to act and inform citizens if a known hazard has been identified.

- **Economic.** Is the mitigation action affordable? Is it eligible under grant or other funding programs? Can it be completed within existing budgets?
- **Environmental.** Does the mitigation action cause adverse impacts on the environment or can they be mitigated? Is it the most appropriate action among the possible alternatives?

FEMA in collaboration with the American Planning Association has released the publication, "Integrating Hazard Mitigation into Local Planning." This guide explains how hazard mitigation can be incorporated into several different types of local planning programs. For more information, go to www.planning.org or http://www.fema.gov/library.

Your local Hazard Mitigation Plan is a valuable place to identify and prioritize possible mitigation actions. The plan includes a mitigation strategy with mitigation actions that were developed through a public and open process. You can then add to or modify those actions based on what is learned during the course of the Risk MAP project and the information provided within this FRR.

4.3 Mitigation Programs and Assistance

Not all mitigation activities require funding (e.g., local policy actions such as strengthening a flood damage prevention ordinance), and those that do are not limited to outside funding sources (e.g., inclusion in local capital improvements plan, etc.). For those mitigation actions that require assistance through funding or technical expertise, several State and Federal agencies have flood hazard mitigation grant programs and offer technical assistance. These programs may be funded at different levels over time or may be activated under special circumstances such as after a presidential disaster declaration.



Communities can link hazard mitigation plans and actions to the right FEMA grant programs to fund flood risk reduction. More information about FEMA HMA programs can be found at http://www.fema.gov/government/grant/hma/index.shtm.

4.3.1 FEMA Mitigation Programs and Assistance

FEMA awards many mitigation grants each year to states and communities to undertake mitigation projects to prevent future loss of life and property resulting from hazard impacts, including flooding. The FEMA Hazard Mitigation Assistance (HMA) programs provide grants for mitigation through the programs listed in Table 4.2 below.

Table 4-2. FEMA Hazard Mitigation Assistance Programs

Mitigation Grant Program	Authorization	Purpose
Hazard Mitigation Grant Program (HMGP)	Robert T. Stafford Disaster Relief and Emergency Assistance Act	Activated after a presidential disaster declaration; provides funds on a sliding scale formula based on a percentage of the total federal assistance for a disaster for long-term mitigation measures to reduce vulnerability to natural hazards

Mitigation Grant Program	Authorization	Purpose
Flood Mitigation Assistance (FMA)	National Flood Insurance Reform Act	Reduce or eliminate claims against the NFIP
Pre-Disaster Mitigation (PDM)	Disaster Mitigation Act	National competitive program focused on mitigation project and planning activities that address multiple natural hazards
Repetitive Flood Claims (RFC)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce flood claims against the NFIP through flood mitigation; properties must be currently NFIP insured and have had at least one NFIP claim
Severe Repetitive Loss (SRL)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce or eliminate the long-term risk of flood damage to SRL residential structures currently insured under the NFIP

The HMGP and PDM programs offer funding for mitigation planning and project activities that address multiple natural hazard events. The FMA, RFC, and SRL programs focus funding efforts on reducing claims against the NFIP. Funding under the HMA programs is subject to availability of annual appropriations, and HMGP funding is also subject to the amount of FEMA disaster recovery assistance provided under a presidential major disaster declaration.

FEMA's HMA grants are awarded to eligible states, tribes, and territories (applicant) that, in turn, provide sub-grants to local governments and communities (sub-applicant). The applicant selects and prioritizes sub-applications developed and submitted to them by sub-applicants and submits them to FEMA for funding consideration. Prospective sub-applicants should consult the office designated as their applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers (SHMO) is available on the FEMA website (www.fema.gov).

4.3.2 Additional Mitigation Programs and Assistance

Several additional agencies including USACE, Natural Resource Conservation Service (NRCS), U.S. Geological Survey (USGS), NOAA, and others have specialists on staff and can offer further information on flood hazard mitigation. The State NFIP Coordinator and SHMO are state-level sources of information and assistance, which vary among different states.

The Silver Jackets program, active in several states, is a partnership of USACE, FEMA, and state agencies. The Silver Jackets program provides a state-based strategy for an interagency approach to planning and implementing measures for risk reduction.

5 Acronyms and Definitions

5.1 Acronyms

A

AAL	Average Annualized Loss
ALR	Annualized Loss Ratio
AoMI	Areas of Mitigation Interest

B

BCA	Benefit-Cost Analysis
BFE	Base Flood Elevation
BMP	Best Management Practices

C

CFR	Code of Federal Regulations
CID	Community Idenfitication Number
COG	Continuity of Government Plan
COOP	Continuity of Operations Plan
CRS	Community Rating System
CSLF	Changes Since Last FIRM

D

DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000

E

EOP	Emergency Operations Plan

F

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FRD	Flood Risk Database
FRM	Flood Risk Map
FRR	Flood Risk Report
FY	Fiscal Year

G

GIS	Geographic Information System

H

HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program

I

IA	Individual Assistance

N

NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NRCS	Natural Resource Conservation Service

P

PA	Public Assistance
PDM	Pre-Disaster Mitigation

R

RFC	Repetitive Flood Claims
Risk MAP	Mapping, Assessment, and Planning

S

SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SRL	Severe Repetitive Loss

U

USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

5.2 Definitions

0.2-percent-annual-chance flood – The flood elevation that has a 0.2-percent chance of being equaled or exceeded each year. Sometimes referred to as the 500-year flood.

1-percent-annual-chance flood – The flood elevation that has a 1-percent chance of being equaled or exceeded each year. Sometimes referred to as the 100-year flood.

Accredited Levee System – A levee system that FEMA has shown on a FIRM that is recognized as reducing the flood hazards posed by a 1-percent-annual-chance or greater flood. This determination is based on the submittal of data and documentation as required by 44CFR65.10 of the NFIP regulations. The area landward of an accredited levee system is shown as Zone X (shaded) on the FIRM except for areas of residual flooding, such as ponding areas, which are shown as Special Flood Hazard Area (SFHA).

Annualized Loss Ratio (ALR) – Expresses the annualized loss as a fraction of the value of the local inventory (total value/annualized loss).

Average Annualized Loss (AAL) – The estimated long-term weighted average value of losses to property in any single year in a specified geographic area.

Base Flood Elevation (BFE) – Elevation of the 1-percent-annual-chance flood. This elevation is the basis of the insurance and floodplain management requirements of the NFIP.

Berm – A small levee, typically built from earth.

Cfs – Cubic feet per second, the unit by which discharges are measured (a cubic foot of water is about 7.5 gallons).

Coastal High Hazard Area (CHHA) – Portion of the SFHA extending from offshore to the inland limit of a primary frontal dune along an open coast or any other area subject to high velocity wave action from storms or seismic sources.

Consequence (of flood) – The estimated damages associated with a given flood occurrence.

Crest – The peak stage or elevation reached or expected to be reached by the floodwaters of a specific flood at a given location.

Dam – An artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water.

Design flood event – The greater of the following two flood events: (1) the base flood, affecting those areas identified as SFHAs on a community's FIRM; or (2) the flood corresponding to the area designated as a flood hazard area on a community's flood hazard map or otherwise legally designated.

Erosion – Process by which floodwaters lower the ground surface in an area by removing upper layers of soil.

Essential facilities – Facilities that, if damaged, would present an immediate threat to life, public health, and safety. As categorized in Hazus, essential facilities include hospitals, emergency operations centers, police stations, fire stations, and schools.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters or (2) the unusual and rapid accumulation or runoff of surface waters from any source.

Flood Insurance Rate Map (FIRM) – An official map of a community, on which FEMA has delineated both the SFHAs and the risk premium zones applicable to the community. See also Digital Flood Insurance Rate Map.

Flood Insurance Study (FIS) Report – Contains an examination, evaluation, and determination of the flood hazards of a community, and if appropriate, the corresponding water-surface elevations.

Flood risk – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood vulnerability.

Flood vulnerability – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood risk.

Flood-borne debris impact – Floodwater moving at a moderate or high velocity can carry flood-borne debris that can impact buildings and damage walls and foundations.

Floodwall – A long, narrow concrete or masonry wall built to protect land from flooding.

Floodway (regulatory) – The channel of a river or other watercourse and that portion of the adjacent floodplain that must remain unobstructed to permit passage of the base flood without cumulatively increasing the water surface elevation more than a designated height (usually 1 foot).

Floodway fringe – The portion of the SFHA that is outside of the floodway.

Freeboard – A factor of safety usually expressed in feet above a flood level for purposes of flood plain management. “Freeboard” tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed (44CFR§59.1).

Hazus – A GIS-based risk assessment methodology and software application created by FEMA and the National Institute of Building Sciences for analyzing potential losses from floods, hurricane winds and storm surge, and earthquakes.

High velocity flow – Typically comprised of floodwaters moving faster than 5 feet per second.

Levee – A human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding. (44CFR§59.1)

Loss ratio – Expresses loss as a fraction of the value of the local inventory (total value/loss).

Mudflow – Mudslide (i.e., mudflow) describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. A mudslide (i.e., mudflow) may occur as a distinct phenomenon while a landslide is in progress, and will be recognized as such by the Administrator only if the mudflow, and not the landslide, is the proximate cause of damage that occurs. (44CFR§59.1)

Non-Accredited Levee System – A levee system that does not meet the requirements spelled out in the NFIP regulations at Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44CFR65.10), Mapping of Areas Protected by Levee Systems, and is not shown on a FIRM as reducing the flood hazard posed by a 1-percent-annual-chance flood.

Primary frontal dune (PFD) – A continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

Probability (of flood) – The likelihood that a flood will occur in a given area.

Provisionally Accredited Levee (PAL) – A designation for a levee system that FEMA has previously accredited with reducing the flood hazards associated with a 1-percent-annual-chance or greater flood on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will demonstrate the levee system's compliance with the NFIP regulatory criteria cited at 44CFR65.10.

Risk MAP – Risk Mapping, Assessment, and Planning, a FEMA strategy to work collaboratively with state, local, and tribal entities to deliver quality flood data that increases public awareness and leads to action that reduces risk to life and property.

Riverine – Of, or produced by, a river. Riverine floodplains have readily identifiable channels.

Special Flood Hazard Area (SFHA) – Portion of the floodplain subject to inundation by the 1-percent-annual or base flood.

Stafford Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. This Act constitutes the statutory authority for most federal disaster response activities especially as they pertain to FEMA and FEMA programs.

Stillwater – Projected elevation that flood waters would assume, referenced to National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or other datum, in the absence of waves resulting from wind or seismic effects.

Stream Flow Constrictions – A point where a human-made structure constricts the flow of a river or stream.

6 Additional Resources

ASCE 7 – National design standard issued by the American Society of Civil Engineers (ASCE), *Minimum Design Loads for Buildings and Other Structures*, which gives current requirements for dead, live, soil, flood, wind, snow, rain, ice, and earthquake loads, and their combinations, suitable for inclusion in building codes and other documents.

ASCE 24-05 – National design standard issued by the ASCE, *Flood Resistant Design and Construction*, which outlines the requirements for flood resistant design and construction of structures in flood hazard areas.

National Flood Insurance Program (NFIP), Federal Emergency Management Agency (FEMA), www.floodsmart.gov

FEMA, www.fema.gov

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7 Data Used to Develop Flood Risk Products

GIS base map information was acquired from the following sources:

- Nebraska Department of Natural Resources
- US Census Bureau
- Communities in watershed
- Nebraska Public Service Commission GIS Data Repository
- Farm Services Agency
- Flood Map Desktop
- HAZUS