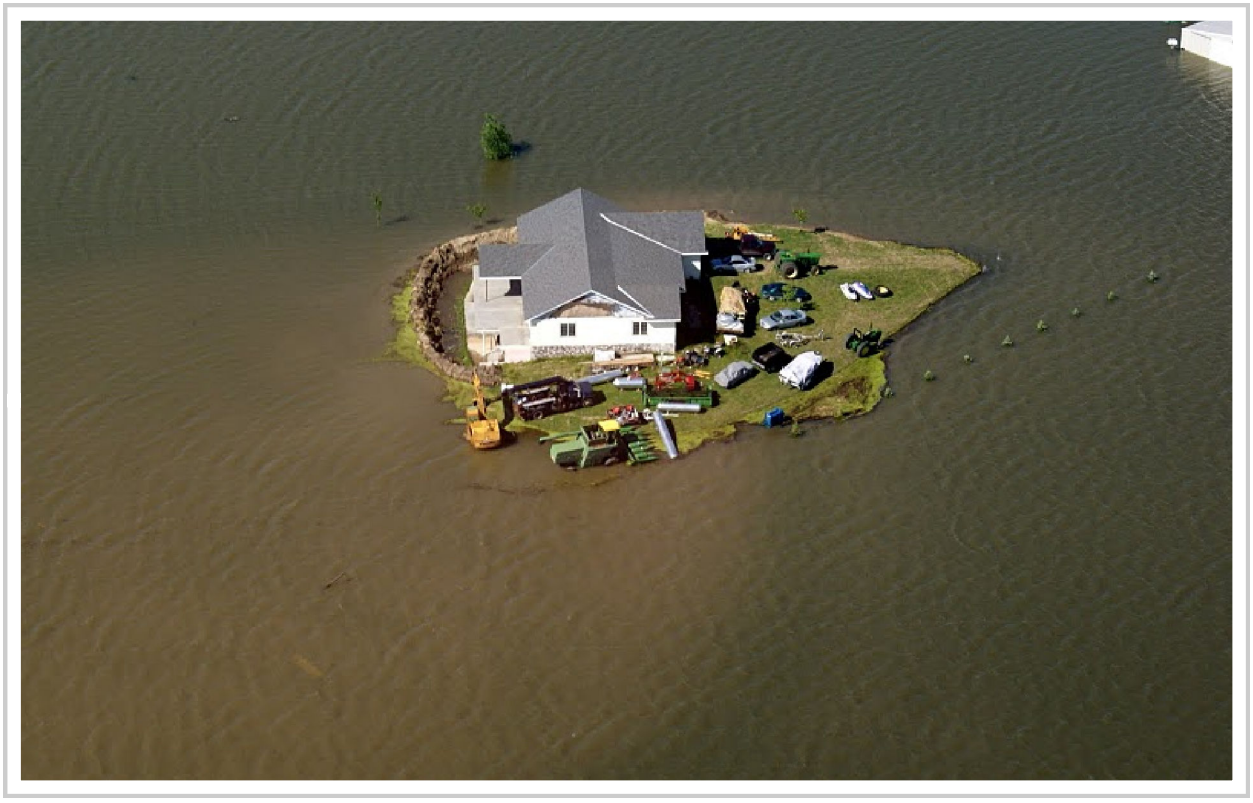
2013

FLOOD HAZARD MITIGATION PLAN

State of Nebraska



Nebraska Department of Natural Resources
Floodplain and Dam Safety Division
Fourth Floor State Office Building
P.O. BOX 94676
Lincoln, NE 68509

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICIES

I. INTRODUCTION

A. PURPOSE

The purpose of the Nebraska State Flood Mitigation Plan is to summarize previous flood problems of Nebraska, assess and summarize flooding risk and vulnerabilities to the State, and to recommend mitigation alternatives which will reduce or eliminate the potential threat to life safety and economic impacts of flooding problems in the State.

The current State Flood Mitigation Plan update is being completed in order to formalize and guide the flood mitigation program direction and activities at the State level within Nebraska. The primary authority for this effort lies within the Nebraska Department of Natural Resources (NDNR). Ultimately, the primary purpose for this plan is to identify flood mitigation needs and priorities within the State and how these needs can be effectively met.

For the purpose of consistency with the Nebraska State Hazard Mitigation Plan (State HMP) as well as the requirements of Chapter 44 of the Code of Federal Regulation (CFR) §201.4, this plan is organized into sections that correlate with the CFR requirements for a Standard State Mitigation Plan.

B. OBJECTIVES

The primary focus of flood mitigation efforts and programs in Nebraska is the elimination of damages to public and private structures and infrastructure, prevention of loss of life, and minimizing damage to agricultural lands. A secondary focus is to facilitate preservation of natural and beneficial functions of the floodplain. The ultimate objective for all flood mitigation programs is the complete elimination of flood damages in Nebraska. This State Flood Mitigation Plan is intended to coordinate several sources of existing flood mitigation planning by doing the following:

- Revising and updating the prior State Flood Mitigation Plan published in January, 2003. Content that is valid has been maintained while outdated content has been updated or modified to reflect current data and programs. It should also be noted that the 2003 State Flood Mitigation Plan was completed under previous guidance for Flood Mitigation Plans developed under the Federal Emergency Management Agency (FEMA) Flood Mitigation Assistance (FMA) program. Due to this, some of the format and data of the prior plan are not consistent with the current standard State Mitigation Plan format. Therefore, this plan has been updated to the format of a standard State plan.
- Coordinating with the flood mitigation goals and objectives contained in currently effective local Hazard Mitigation Plans (HMP's).
- Coordinating with the current State HMP (Reference 1) published in 2011. Data within this flood mitigation plan are also intended to be the basis for the future flood hazard related sections of the State HMP.

C. AUTHORITY AND ADOPTION

As empowered in Chapter 31, Article 10 of the Floodplain Management Statute, the NDNR has been given authority by the Nebraska Legislature for all matters pertaining to floodplain management. The NDNR is the State's coordinating agency for the National Flood Insurance Program (NFIP) and has the authority for providing technical assistance and guidance only; the NDNR has very limited compliance enforcement authority for floodplain development. NDNR's authority is extended to include the administration of FEMA's Flood Mitigation Assistance (FMA) Program as well as the Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) programs.

The State of Nebraska Flood Mitigation Plan was originally published in January, 2003. Since that time, elements of the plan have been used as the basis for the flooding risk assessment and mitigation strategy within the State HMP, which was updated under the direction of the Nebraska Emergency Management Agency (NEMA) in 2005, 2008, and 2011. The formal adoption of the flooding risk assessment and mitigation strategy occurred via the State HMP. Adoption information is contained in the Governor's adoption letter within the preface and on page 4 in Section 1 of the State HMP. The State HMP is included electronically in Appendix C.

The information in this flood mitigation plan developed by NDNR is anticipated to be the basis for the flooding risk assessment and mitigation strategy incorporated as part of Nebraska's 2014 State HMP update.

II. PLANNING PROCESS

A. FLOOD MITIGATION PLAN HISTORY

The State of Nebraska Flood Mitigation Plan was originally developed by the NDNR during 2002 and published in January, 2003. Since that time, elements of the plan have been used as the basis for the flooding risk assessment and mitigation strategy alternatives within the State HMP, which was updated under the direction of the NEMA in 2005, 2008, and 2011.

Since 2003, numerous flood events have occurred and mitigation projects have been completed at various locations. The focus of NDNR's mitigation programs and projects has also changed as available funding sources have changed and FEMA's initiatives, such as Risk MAP, have been modified. Additionally, many of the mitigation priorities identified in the 2003 flood mitigation plan have been implemented to some extent, including a significant expansion of effective local hazard mitigation plans.

For an electronic copy of the January, 2003 State Flood Mitigation Plan, see Appendix D.

B. FLOOD MITIGATION PLAN DEVELOPMENT

During the 1990's, 58 Nebraska counties were declared Presidential disaster areas because of flooding in seven separate disasters, which led to public assistance awards of over $110 million dollars (aggregate of 1990's disaster events, dollar basis varies). During the 2000's, flooding losses continued due to significant flooding events, resulting in ten declared disasters and over $235 million dollars in public assistance awarded (aggregate of 2000's disaster events, dollar basis varies). During 2010 and 2011, record flooding occurred along the Elkhorn, North Platte, and Missouri Rivers causing over $147 million dollars (aggregate of events, dollar basis varies) in public assistance dollars to be needed in Nebraska. This type of ongoing risk, along with NDNR's mission to promote effective floodplain management and flood risk mitigation, was the purpose for the original 2003 flood mitigation plan. While mitigation efforts have been implemented, the risk of flooding damage continues and is the reason for development of this Flood Mitigation Plan and future related updates to the State HMP.

Mitigation projects and programs occur at the local and State levels, which means that an examination of mitigation programs and measures must be conducted via flood mitigation planning in order to show that effective flood mitigation programs can be initiated or maintained in Nebraska. Mitigation plan coverage areas in Nebraska currently range from village, city, county, Natural Resource District, and to NEMA region based plans. A comprehensive statewide flood mitigation strategy is vital for reducing or eliminating the impacts of flood disasters in Nebraska. It does this by recording where the flood problems have occurred in the past and provides recommendations for how these vulnerabilities can be reduced or eliminated in the future.

According to FEMA, flood mitigation is defined as, "Any sustained action that reduces or eliminates long-term risk to people and property from the effects of floods." While most mitigation measures are put in place after a dramatic disaster experience captures public attention, the most effective flood mitigation activities seek to address a jurisdiction's

flood problem before a flood occurs. Mitigation is a cost-effective way to reduce or eliminate flood losses and the recovery costs individuals, businesses, and government must pay. Besides reducing the direct costs associated with natural hazards, mitigation reduces important indirect costs, such as the disruption of daily routines, community services, commerce, and industry. Mitigation has gained in popularity because it ends up saving money over the long-term since mitigation projects are a one-time expense compared to potentially multiple future disaster assistance payments.

There are two types of basic flood mitigation projects: structural and nonstructural. As the name implies, structural techniques seek to build structures in order to change or "control" the physical environment; thus, common techniques are dams, levees, or floodwalls.

Throughout the last century, national flood losses continued to increase despite the expenditure of billions of dollars for structural flood control. As a result, nonstructural solutions became preferred alternatives. Instead of modifying the physical landscape, nonstructural solutions encourage approaches that adapt development to the characteristics of the flood rather than modifying the flood. Examples of nonstructural flood mitigation activities are stricter floodplain zoning ordinances, flood warning systems, flood insurance, acquiring or elevating at-risk structures, and flood proofing.

We are currently in a multi-objective era of analyzing several different approaches to reducing flood damage in order to incorporate as many private, public, environmental, and other benefits as possible. A combination of structural and nonstructural methods of flood mitigation can be assessed and used for their inherent benefits.

FEMA is the Federal entity responsible for administering the National Flood Insurance Program (NFIP), responding to disasters, and disbursing aid payments for flooded communities and victims. As a result of the escalating costs of flood disaster assistance, FEMA has advanced nonstructural flood mitigation through several different programs: the Flood Mitigation Assistance (FMA) program, Pre-Disaster Mitigation (PDM) program, and the Hazard Mitigation Grant Program (HMGP). These hazard mitigation programs are explained in detail in later sections of this plan. In Nebraska, we also have the unique capability of potentially utilizing regional funds from Natural Resource Districts (NRDs) which can be used to supply non-federal matching funds for mitigation plans and projects if the NRD decides to partner with local communities.

All natural disasters increase public awareness of the possible hazards, their impacts and costs, and the actions needed to reduce or eliminate a reoccurrence of the same event in the future. Disasters can impact lives severely, but there tends to be a short-term memory of the lessons that a disaster teaches. Dealing with disaster risk often takes a back seat to normal day to day activities. This gap between awareness and information requires State-based planning efforts designed around the particular flood hazards faced by the affected individuals. This State Flood Mitigation Plan outlines the current risk in Nebraska, the agencies which operate programs that can reduce these risks, and offers suggestions about how key State agencies in Nebraska with an interest in flood mitigation can work

together in order to coordinate their efforts and work toward a common goal of reducing flood damages.

C. DOCUMENTATION OF THE PLANNING PROCESS

Development of the approved and adopted 2011 State HMP included an extensive multi-agency planning process, which incorporated input from the Governor's Task Force for Disaster Recovery. This Task Force was created in 1994 following a year of significant flooding and tornados within the State. Through the planning process for the State HMP, goals and objectives relevant to flood risk assessment and mitigation were developed. Information on this planning process can be found on page 2-1 of the State HMP included in Appendix C.

For the purposes of this Flood Mitigation Plan, the NDNR has focused on development of an improved flooding risk assessment via local plan coordination, as well as coordination of the plan elements with other State programs focused on flood mitigation and risk reduction. In Nebraska, the primary State agency focusing in floodplain management programs and policies is the NDNR. However, the 23 Natural Resource Districts often play a significant role in shaping regional floodplain management and mitigation policies, therefore, NRD input has been sought during development of this plan. For a map of the NRDs within Nebraska, please refer to the following Figure II.1 Nebraska Natural Resources Districts. Additionally, due to the role NEMA plays with administration of the HMGP program and associated flood mitigation programs within Nebraska, NEMA's input has also been requested. Finally, review and input has been sought from the U.S. Army Corps of Engineers (USACE) due to that agency's ongoing role with flood risk reduction and mitigation projects within the State and region.

NDNR has prepared this plan based on the floodplain management and mitigation priorities of the agency as well as input from various State and Federal agencies. The plan is based on numerous sources, including FEMA policy, the State HMP, NDNR floodplain management and floodplain mapping policies and priorities, and input from NRDs. Plan update priorities were initially screened by NDNR based on other coordinating planning processes and priorities. This was done due to NDNR's extensive involvement in these processes and detailed knowledge of floodplain management and mitigation priorities within Nebraska. General goals and objectives are intended to be consistent with the State HMP as well as the priorities of local HMP's. However, they have been modified to reflect current floodplain management priorities of the NDNR and other cooperative agencies with an interest in floodplain management in Nebraska.

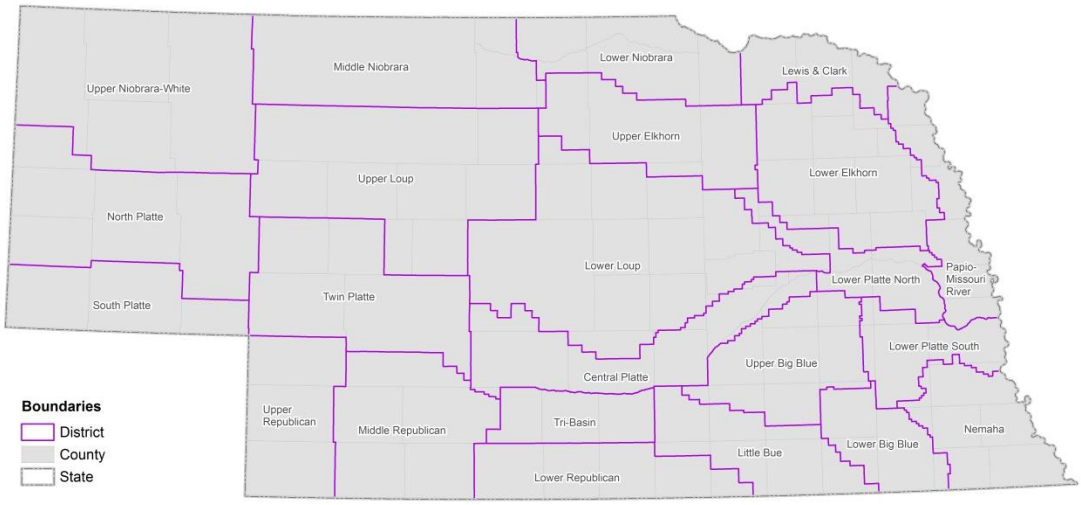


FIGURE II.1 NEBRASKA NATURAL RESOURCES DISTRICTS

D. COORDINATION AMONG STATE AND FEDERAL AGENCIES

As mentioned previously, the 2011 State HMP went through an extensive multi-agency planning process, which is discussed in Section 2 of that plan starting on page 2-1. Flood mitigation initiatives were a part of the State HMP.

Coordination among State and Federal agencies is addressed on pages 2-10 through 2-18 of the State HMP. The primary authorities involved in the planning process for this Flood Mitigation Plan related to flood mitigation initiatives were NDNR, NEMA, Nebraska NRDs, FEMA, and the USACE. As part of the development of this Flood Mitigation Plan, NDNR coordinated with these agencies to review the plan in anticipation of incorporating the plan details into future State HMP updates. During the revision of the State Flood Mitigation Plan, each agency received a copy of the draft plan for review and was given the opportunity to review the plan and provide comments to NDNR. Comments were received from FEMA, the USACE, the Lower Platte South NRD, and the Papio-Missouri River NRD. All comments were evaluated and the flood mitigation plan was updated accordingly.

E. INTEGRATION WITH OTHER STATE PLANNING EFFORTS

This Flood Mitigation Plan is intended to be the basis for updates to the flood mitigation sections of the future 2014 State HMP update.

III. RISK ASSESSMENT

In order to establish targeted flood mitigation strategies for the State of Nebraska, an updated flood risk assessment was completed. This assessment was based on the best information available during the plan development process. Included in the risk assessment is identification of the types of flooding that typically impact Nebraska along with historical accounts of key major flood events within the major watersheds of the State. An assessment of vulnerability to flooding based on the 1% annual chance event and potential losses at the county level based on available data including risk assessments from local HMP's is also provided. Finally, the vulnerability and potential losses to State facilities is assessed. FEMA defines risk assessment terminology as follows:

- Hazard: natural or manmade source or cause of harm or difficulty.
- Vulnerability: physical feature or operational attribute that renders an entity open to exploitation or susceptible to a given hazard.
- Risk: potential for an unwanted outcome resulting from an incident, event, or occurrence, as determined by its likelihood and the associated consequences. Also defined as the measure of the probability and severity of undesirable consequences. Risk = (Frequency of an event) x (Probability of occurrence) x (Consequences).
- Risk Assessment: product or process which collects information and assigns values to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making.

A. IDENTIFYING FLOOD HAZARD TYPES

The following section outlines the types of flood hazards that are typical in Nebraska.

1. TYPES OF FLOOD RISK IN NEBRASKA

Nebraska has a diverse environment and a broad range of topography, geology, and weather variations from east to west and from north to south. For example, Nebraska can experience on average 34 inches of rain annually in the east and 16 inches of rain annually in the west. Due to the range of conditions, there are also different types of flooding along Nebraska's rivers. The type of flooding which takes place on a river is typically a function of watershed characteristics such as soils, slope, and level of development. Different types of river channels may have different flooding characteristics.

2. TYPES OF RIVERS AND CHANNELS

There are three general types of rivers and channels in Nebraska including mature, young, and modified rivers or channels.

Mature rivers are best characterized by shallow depth, low slope, and a braided appearance with numerous sandbars shifting with changes in stream flow. The Platte River in Nebraska is one of the best examples in the nation of a mature river. The character of mature rivers can be impacted by channel modifications, especially those that modify the channel length such as straightening.

Young rivers are characterized by a steep slope and have a single channel with a straighter course than mature rivers. A young river typically erodes its channel bottom (downcutting) and banks (lateral erosion) to enlarge its channel in order to become more like mature rivers. Often, historical practices such as channel straightening have increased erosion to the channel bottoms and banks of these types of rivers. Most rivers and creeks in Nebraska are characterized as young rivers even though many have an extensive floodplain. Examples of young rivers in Nebraska include the Little Nemaha, Big Nemaha, Little Blue, and Big Blue.

Modified rivers are characterized by extensive civil works such as channel widening and dredging, construction of navigation structures, and construction of flow modification structures such as levees. The best example of an extensively modified river in Nebraska is the Missouri River because the majority of the Missouri has been modified, channelized, leveed, or dammed. The Missouri adjacent to some parts of Nebraska has characteristics of a mature river and is braided; but for the most part these characteristics have been modified for the river reach that borders the eastern edge of the State. For this reason, the Missouri is unique among rivers that expose Nebraska to flood risk.

3. TYPES OF POTENTIAL FLOODING

Flooding of normally dry land areas typically results when a stream channel overflows due to excess runoff that exceeds channel capacity. These normally dry land areas adjacent to stream channels that have potential for flooding are floodplains. Every creek and river has a floodplain no matter how long it has been in existence. Simply put, the floodplain is the area which is inundated by water during a flooding event. The characteristics of the flooding such as rate of rise, overall magnitude (peak flow), duration, and frequency are a result of the climate and geographic characteristics of the area. Floods are typically measured in terms of magnitude and the probability that they will occur. FEMA floodplain maps and floodplain management regulations are currently based on the 1 percent annual chance flood, which is the flood that has a 1% chance of being equaled or exceeded in any year.

Types of floods and overall flooding characteristics vary depending on the type of flooding and the source of the runoff. Flooding characteristics are also impacted by the presence of dams or levees if these features are present within the subject watershed. Riverine floods, flash floods, ice jamming, dam failure, and levee failure are the possible types of potential flooding in Nebraska.

- Typical riverine flooding happens as a result of heavy precipitation or snow melt runoff occurring over a watershed for a period of several days to even weeks. This type of flooding most commonly impacts medium to large channels including but not limited to the Big Blue River, Elkhorn River, Loup River, Platte River, and Missouri River. The Missouri River during the flood of 1993 is an example of riverine flooding because many Missouri River tributaries in the Midwest were also at or above flood stage. Riverine floods usually can be tracked

and anticipated with estimates of crests and stage heights. This allows for distribution of advance flood warning. Geology also has a unique impact on the nature of riverine flooding for some rivers in Nebraska. Sandhills rivers, located in certain areas of the central and western part of the State, are primarily fed through groundwater and flooding in general is rare. In addition the sandhills act as a reservoir by quickly absorbing rainfall and adding to groundwater supplies, which then release water to sandhills rivers and streams in controlled amounts.

- Flash floods are a result of extreme runoff events such as heavy thunderstorms or rapid springtime snowmelt. This type of flooding is most commonly associated with smaller channels and watersheds that typically have steeper slopes and is common along streams within urban areas. Typically, flash flooding cannot be accurately tracked and anticipated with estimates of crests and stage heights. This characteristic inhibits the potential for distribution of advanced flood warning in the event of a flash flood.
- Ice jam flooding is possible along wider, braided channels and is most common along the Loup River and Platte River but has occurred along the Elkhorn and Missouri Rivers. The Platte and Loup have wide, shallow stretches which allow for ice accumulation; as the ice breaks up, it stacks up on itself where the channel narrows, creating a jam that backs up water and causes flooding. Ice jams are often made worse by blockages to river flow such as bridge piers or vegetation. River levels immediately behind this dam of ice are capable of rising at extremely rapid rates, often flooding riverside areas in minutes rather than hours or days. Ice jams are also prone to breaking up unexpectedly which can lead to the sudden release and movement downstream of floodwaters that are behind the ice jam. Flooding may be made worse when a period of rapid snowmelt and/or heavy rainfall accompanies the formation of an ice jam. Due to the potentially rapid nature of ice dam formation, consistent distribution of flood warning information for areas susceptible to ice jams is difficult.
- Dam failure flooding may occur due to hydrologic overtopping (exceeding design capacity) or structural failure of a dam embankment. Dams may be present in either rural or urbanized areas. A dam failure typically results in a rapid release of floodwaters over a short amount of time. These floodwaters typically move downstream quickly and have the potential for serious impacts with little warning time.
- Levee failure may occur due to hydrologic overtopping (exceeding design capacity) or structural failure of a levee embankment. Levees may be adjacent to either rural or urban areas. A levee failure typically occurs while flooding is already underway and could result in a rapid release of floodwaters over a short amount of time. These floodwaters typically move into the levee protected area quickly and have the potential for serious impacts with little warning time. Levee

protected areas also have the potential for damage due to underseepage or internal drainage induced ponding on the landward side of the levee. These conditions may occur during high water due to seepage of flood water under the levee embankment, gravity drainage systems being closed, or lack of pumping capacity.

B. FLOOD HAZARD LOCATION OVERVIEW

Like most states, many flood problems in Nebraska have their roots in the initial development of communities along watercourses within the State. With its location on the Missouri River, Omaha played a role in westward expansion of the nation. During this time, water was vital for transportation, running mills, and creating power; thus, development took place in close proximity to these water sources. As a result, historical infrastructure and development near rivers is often subject to flood risk. Flooding in Nebraska has the potential to affect either urban areas or rural agricultural areas.

Consideration of replacing or relocating historical development out of the floodplain has often been prohibitively expensive; thus, some communities have constructed a structural flood control project such as a floodwall, levee, or dam to protect development. Unfortunately, these structural flood control projects have the potential to exacerbate flood problems. The land protected by a structural flood control project may attract further new development, which typically puts more infrastructure at risk. Thus, if a floodwall, levee, or dam is breached or overtopped during a flood event, damages tend to be much more severe and underinsured than if a floodwall or levee had never been built.

It is also important to recognize that a floodwall, levee, or dam that is designed to provide a certain level of flood protection may become outdated as upstream development changes. The designed flood protection level may be exceeded if the runoff from upstream is increasing due to urbanization or other factors.

Nebraska has a number of major watersheds and rivers including over 5,000 wetlands, 2,000 natural lakes, and over a 1,000 reservoirs and sandpit lakes. Further, Nebraska ranks 10th nationally in the number of stream miles and 16th nationally in total wetland acres (Reference 2). The following sections include an overview of the flooding history of major watersheds by basin, as well as a summary of potential flooding risks due to dam failure and levee failure. The following Figure III.1 Subregion (4-Digit Hydrologic Units) shows an overview of the major watersheds within the State.

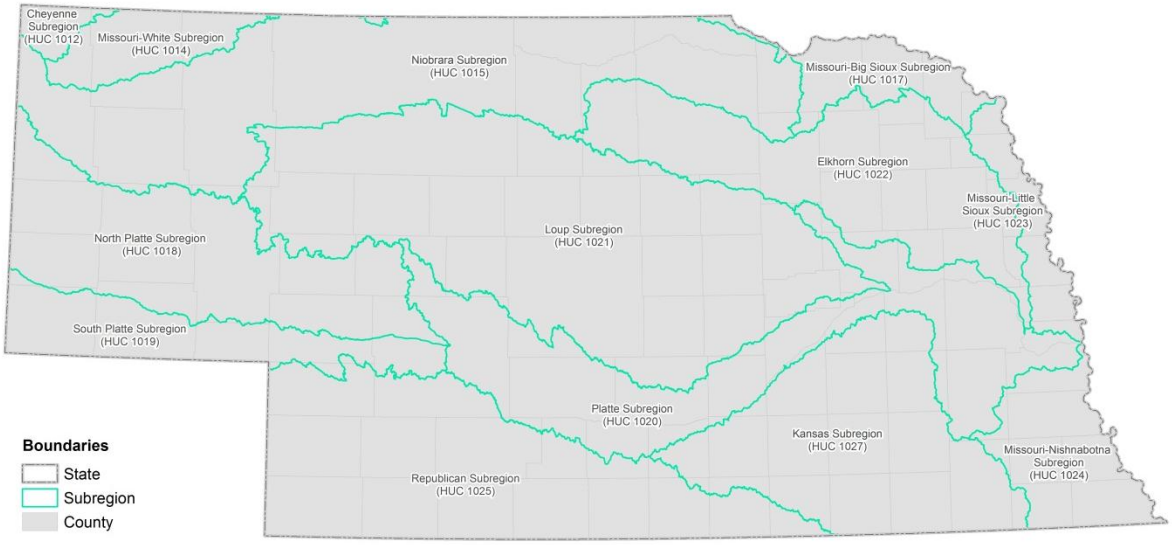


FIGURE III.1 SUBREGION (4-DIGIT HYDROLOGIC UNITS)

1. LOCATION OF FLOOD HAZARDS AND HISTORICAL OCCURRENCES BY WATERSHED

Appendix E provides a brief summary of floods in the State of Nebraska dating back to before the turn of the century. Newspapers (the Lincoln *Journal Star* and Omaha *World Herald*) were the primary sources used in this compilation, and this information should not be considered as an exhaustive list. Historical data are supported by information taken from the National Climatic Data Center Storm Events Database (Reference 3). FEMA Flood Insurance Studies were also used for the counties and communities in Nebraska which have detailed floodplain studies. This historical compilation is a work in progress, and the receipt of any flood information not on this list will be added to future editions of this document. Due to the nature of reporting in newspapers, most flood events listed in Appendix E do not have specific damage estimates. If articles were found which stated estimated damage totals, those figures were used; otherwise, only major flood events with extensive damage tend to have dollar estimates. Where available, FEMA disaster declaration information and public assistance dollars awarded is supplied for federally declared disasters.

Table 1 Floods of Record for Select River Gages in Nebraska, located in Appendix B, lists the current highest recorded discharge and stage for rivers in Nebraska. The U.S. Geological Survey (USGS) and NDNR maintain records for many stream and river gages around the state. However, in some situations, some gage reports have been variable over time with respect to peak stage and peak discharge, and the peaks for each parameter may not have occurred during the same flood event. This may have occurred for several possible reasons – the gaging station was not installed when the peak flood occurred but the peak was recorded by some other means, better measurement equipment, differing measuring points or methods for each parameter between the recorded data points,

or because of channel and/or floodplain modifications that have occurred over time and have impacted the flooding characteristics. For example, extensive levee and channel modifications along the Missouri River since the 1952 flood may have led to higher potential peak stages at lower flows. The peak flow for the Missouri River at Nebraska City occurred in 1952 with a crest of 26.57 feet and discharge of 414,000 cubic feet per second (cfs). However, 2011 Missouri River flooding produced a crest of 28.27 feet at a lower discharge of 229,000 cfs. In general, the exact cause for these discrepancies has not been determined. In cases such as these the data for each relevant peak flow and peak stage entry is reported in Table 1.

The following summary of historical occurrences of flooding in Nebraska contains a watershed by watershed review of rivers which have historically caused the most damaging flood events. It includes some mitigation actions already implemented within the referenced watersheds in response to historical flooding. It should be noted that this summary does not include all locations subject to potential flooding or all flood events. It is intended to show that the risk of flooding is present statewide and has occurred in a wide variety of watersheds and stream types. This information is primarily being provided to describe the historical occurrences of flooding and typical flooding characteristics of major watercourses in the State. It is not being used to directly assess potential losses. This assessment is addressed in section III. D – Estimating Potential Losses and is based on assessments of potential losses as presented in adopted local HMP's (References 4 – 30). Typically, the potential losses assessment from local HMP's is based on the 1% annual chance flood event, rather than specific historical occurrences and peak floods as described within this section. Major floods, such as the Republican River flood of 1935 and the Missouri River floods of 1952, 1993, and 2011, are detailed within their individual river listing.

Kansas Subregion (HUC 1027)

Big Blue River

There is a lengthy history of flooding on the Big Blue River. According to the Gage County FIS (Reference 31), the River has 3,901 square miles of upstream drainage area at Beatrice. Flooding has caused the River to exceed the 16-foot flood stage numerous times in the 92 years of gage records for the City. Upstream of Beatrice, the Village of DeWitt is situated entirely in the Big Blue River floodplain. Major flood events in 1984 and 1993 were especially devastating for DeWitt and Beatrice. The most recent severe flooding event in the basin occurred during 2007, when 4-5 inches fell over the watershed between May 4th and May 6th. The Big Blue River reached a crest of 23.9 feet, about 7.9 feet above flood stage, at Beatrice on May 7th. Heavy spring or summer rain is the most common initiating factor for flooding in the Big Blue basin; however, rapid snowmelt and ice jam floods have occurred.

Prior mitigation actions implemented within this watershed include levees at Fairbury and Seward (Reference 32) as well as acquisition and removal of floodprone structures in Beatrice.

Elkhorn Subregion (HUC 1022)

Elkhorn River

Heavy spring or summer rain is the most common initiating factor for flooding in the Elkhorn River basin; however, rapid snowmelt and ice jam floods have occurred. Ice jam flooding can be problematic, especially at the confluence of the Elkhorn River and the Platte River.

The first major Elkhorn River flood documented in historical accounts affected the towns of Waterloo, Arlington, Hooper, Scribner, Winslow, and potentially several others on June 10-12, 1944. The discharge of the Elkhorn at Waterloo is listed as 100,000 cubic feet per second (cfs). Although there are not detailed damage estimates available for the 1944 flood, by comparing this flood to the 40,000 cfs gage reading at West Point which flooded one-third of the town on March 29-April 5, 1960, the damages in 1944 throughout this reach of the Elkhorn River may have been extensive. Waterloo was flooded again from March 25-April 1, 1962, and much of the town was evacuated. During the years following this major flooding, the USACE constructed several levees at communities that are within the Elkhorn River watershed. Waterloo, Hooper, Scribner, West Point, Howells, Clarkson, Pender, Wakefield, Norfolk, Madison, Pierce, and Meadow Grove are all communities within the watershed that now have some flood risk protection from levee systems. The flood protection levee systems within the lower Elkhorn watershed represent the largest number of levee protected communities within any watershed in Nebraska (Reference 32).

The most recent flooding event of the Elkhorn River occurred during 2010. Widespread rainfall over the watershed during June, 2010, caused flooding of the Elkhorn River and its tributaries. Rainfall of at least 3 to 5 inches fell over much of the upper Elkhorn River basin in mid-June. West Point received nearly 11 inches of rain in one week. This caused record or near record flooding along the Elkhorn River from Clearwater downstream to the Elkhorn's confluence with the Platte River. The Elkhorn River near West Point crested close to 15.2 feet and remained above flood stage for over ten days. Flood damages amounted to millions of dollars in damages to public and private property. Federal disaster DR-1924 (Reference 33) was declared for 53 counties in Nebraska for June flooding.

Prior mitigation actions implemented within this watershed include multiple levees as referenced above and acquisition and removal of floodprone structures at King Lake.

Elkhorn River Tributaries

Norfolk has also witnessed several damaging flood events. The North Fork Elkhorn River caused frequent flooding in Norfolk and Pierce in the 1950s and 1960s. On April 2, 1960, most of Pierce was evacuated due to flooding, and in March and April of 1962, half of the town was evacuated due to flooding. Corporation Gulch in Norfolk was also a frequently-flooded area; in May and June of 1967 flooding caused estimated $1.5 million damage to an industrial area in Norfolk. Channel modifications and levees have since been added around the Norfolk area to help reduce flooding.

Republican Subregion (HUC 1025)

Frenchman Creek

In the 25-year period from 1935 to 1960, the Frenchman had five severe floods. Of the three floods with reports, one was an ice jam which caused the Enders Dam to overtop, and two were from heavy summer rains. More recently, the flow of the Frenchman has been depleted due to increased upland and irrigation uses; consequently, flooding has not typically been a problem in recent years.

Aside from the major flood of 1935 (see Republican River section), perhaps the next most severe flood along the Frenchman took place on June 17-18, 1956 when over 4.5 inches of rain fell in a short period, inundating the entire town of Wauneta.

Republican River

The Republican River has the distinction of having caused the deadliest flood event in Nebraska history. Like many other places in the West during the Great Depression, the spring of 1935 was extremely dry. However, during May significant rainfalls occurred over Nebraska and upstream in Colorado. These storms produced significant amounts of rainfall - 24 inches in 24 hours was recorded along the South Fork Republican River. The entire upper Republican watershed witnessed an average rainfall of nine inches (Reference 34). This storm was also unique because it moved in the same direction as the drainage basin.

According to eyewitness accounts, the roar of the flood water could be heard coming down the Republican Valley five miles away. Many survivors also reported that there were two crests – flood water came up, receded slightly, then the second crest greatly exceeded the first. At one point, the flood water rose six feet in thirty minutes and was ten to fifteen feet higher than the previous record crest. Water was twenty feet deep in some places, and the discharge at Cambridge was an incredible 280,000 cubic feet/second. Water was "bluff-to-bluff" in areas where the bluffs are typically at least two miles apart (Reference 35). The town of Haigler was spared because it is situated on higher ground, but places like Parks, Benkleman, Max, Stratton, Trenton, Culbertson, and McCook

were severely impacted and in some cases destroyed. In addition to these towns, deaths also took place in Perry, Arapahoe, Orleans, Oxford, Franklin, Alma, and Cambridge.

The number of deaths attributed to flooding differs depending on the source due to the nature of reporting at the time and because deaths occurred in three states from this event. An estimate is 113 killed – most reports just say "over one-hundred" dead. The damage estimate of $26 million in 1935 dollars may be low – personal losses, bridges, agricultural, and railroad losses were all incredibly heavy (References 36 and 37).

There have been several dams constructed in the Republican basin, most in response to the 1935 flood. Harlan County Dam is the second-largest reservoir in Nebraska and was completed in 1952. In addition to the addition of reservoirs, levees were constructed at Indianola and Bartley (Reference 32). However, flow rates have also decreased over time due to irrigation and other upstream uses. As a result of these updated conditions, damaging floods have not occurred since 1960.

Loup Subregion (HUC 1021)

Loup River and Tributaries

Heavy rainfall and snowmelt can cause flooding along the Loup and North Loup. The Loup River is also subject to ice jam risk. The Loup River has flooded portions of the City of Columbus several times in the past. During one of the worst Loup floods from August 12-15, 1966, thousands of people were evacuated in advance of the floodwaters. A third of the city was affected as the Loup reached up to four miles wide in places. Two homes were destroyed and 25 more sustained major damage. The Wagner's Lake and Stire's Lake areas were hit particularly hard. Total public and private property damage from this event was estimated to be several million dollars. As a response to this flooding, in 1973 the USACE constructed a levee designed to protect Columbus from the 1-percent annual chance flood on the Loup River. In March, 1993, some families were evacuated when an ice jam at the Highway 81 bridge caused $2 million in damage to buildings that are outside of the levee system. During this flooding event, the Columbus Loup River levee system was at risk of overtopping due to the impacts of the ice jam flooding.

Records also show that a levee system has been installed at Broken Bow, which is also within this watershed (Reference 32).

Missouri Subregions (HUC 1017, HUC 1023, HUC 1024 and HUC 1014)

Missouri River

The Missouri River has the largest upstream drainage basin of any river in Nebraska. According to the Otoe County Flood Insurance Study (Reference 38);

the drainage area is 414,400 square miles at Nebraska City. The Missouri has a long history of flooding, and flood problems will continue to potentially impact development within its floodplain. Between the 1930's and 1960's the USACE completed six large reservoirs along the Missouri upstream of Nebraska. These reservoirs are operated for eight authorized purposes including flood control. However, as the floods of 1993 and 2011 illustrate, the Missouri still has the potential for major flooding.

Ice jam, snowmelt, and intense rainfall are all causes of floods which have occurred historically on the Missouri. Floods along the Missouri River in Nebraska have occurred frequently; however, major floods occurred in 1881, 1943, 1952, 1967, 1978, 1984, 1993, 2010 and 2011. The flood of record for discharge in most areas is the flood of April 1952, while the flood of record for gage height in most areas is the flood of June – August 2011. The reason for this may be that the 1952 flood event occurred prior to some channel and floodplain modifications, such as installation of levee systems. It also occurred prior to installation of all of the upstream flood control dams.

The April, 1952 flood is the flood of record for the Missouri River based on discharge. New levee and floodwall systems in the Omaha area were tested for the first time. Although the crest passed Omaha without causing a levee or floodwall breach, flooding damage was extensive along the river. President Truman personally visited the scene of the flooding in Omaha and officially declared it a disaster area.

In 1993, weather conditions brought wave after wave of storms over the Midwest during June and July, dumping record amounts of rain. In the southeastern counties of Pawnee, Nemaha, Otoe, and Richardson, twenty to twenty six inches of rain fell. Ten to twenty inches of rain fell in a band from Harlan County Dam to Omaha. The Missouri set significant crests in Plattsmouth and Brownville, and river levels from Omaha to Rulo were the highest since 1952. The river segment from Brownville to Rulo was above flood stage for the entire month of July. Overtopping along a USACE levee (R-548) near Brownville threatened the Cooper Nuclear Power Plant (Reference 39). Nine states along the Upper Mississippi and Missouri rivers had counties declared disaster areas. In Nebraska, 52 counties were declared Federal disaster areas due to flooding and tornadoes from the severe storms. This flood event was one of the most damaging in Nebraska history at the time.

During June, 2010 many locations from central into northeast Nebraska received 3 to 4 inches or more rainfall in 72 hours resulting in flooding on Missouri River tributaries and subsequently the Missouri River extending from Omaha to Rulo. In Plattsmouth the Missouri River crested at a little over seven feet above flood stage. A federal disaster was declared for 53 counties in Nebraska for June flooding.

The flooding of 2011 was a result of record snowpack in the Rocky Mountains, and record rainfalls in the months of May and June for central and eastern Montana. The heavy rainfall resulted in heavy runoff, which filled the river and its reservoir system to record highs. In order to keep the Missouri river system's reservoirs from overtopping and/or failing record releases were required from the dams. The record releases from Gavin's Point Dam started in May and increased to around 160,000 cfs by mid-June and remained at that level until early August. The high releases produced moderate to major flooding along the Missouri River adjacent to all of eastern Nebraska. Flooding gradually worsened from May into June and then continued through July and into August. The flooding in the Missouri Basin caused a need for approximately $81 million in public assistance, and claimed 5 lives. Significant crop losses occurred between Sioux City, IA and Omaha, NE. In the aftermath of this flood event, several proposed mitigation projects are in process including some significant potential acquisitions of floodprone property.

The Missouri River watershed, including the Missouri River right bank along Nebraska, includes multiple levee systems. There are levees at various locations, especially from Omaha south. These include levee units at Macy, Lake WaConDa, Omaha, and Missouri River Levee units R-616, R-613, R-573, R-562, R-548, R-520, R-513, and R-512 (Reference 32). These levee units provide flood risk reduction for critical facilities ranging from Omaha's Eppley Airfield to the Cooper Nuclear Station at Brownville, NE. It should also be noted that along much of the reach of the Missouri River adjacent to Nebraska, levee systems are also in place along the Iowa border on the left bank of the river. Due to this, flooding through this reach, especially from Omaha south, is more complex due to the interactions of the flooding with multiple levee systems on opposing banks.

Papillion Creek

The combination of a large drainage basin and increasing development has contributed to past flooding in Bellevue and Papillion. Numerous tributaries in the Omaha area all flow into Papillion Creek. A gaging station started on Papillion Creek in 1929 recorded 11 floods through 1965. The flood of record on June 16, 1964 killed seven people as floodwaters destroyed multiple mobile homes, caused major damage to hundreds of homes, and caused millions of dollars in damage in Millard, Ralston, and Papillion.

The USACE included portions of Papillion Creek when it constructed Missouri River Levee Units R-616 and R-613; these levees were designed to supply 1-percent annual chance flood protection at the time of construction. The USACE also built five dams in the Papillion Creek watershed to protect the population from major runoff events. In addition to federal efforts, in 1968 natural resources agencies started installing levee protection systems for Papillion Creek and its tributaries. Since then, the Papio-Missouri River NRD, City of Omaha, and USACE have modified or installed levees on many tributaries of Papillion Creek.

Due to ongoing urbanization, currently Papillion Creek and its tributaries are most vulnerable from flash floods, especially if the flooding causes a levee to fail.

White River

During May, 1991, Crawford experienced significant flooding. Seven inches of rainfall over a short period of time produced flash flooding along the White River that reached levels well above flood stage. The flooding caused numerous public and private property impacts and led to millions of dollars in damage to Crawford.

Platte Subregion (HUC 1018, HUC 1019, and HUC 1020)

Platte River

With its wide channel, shallow depth, and braided appearance with sandbars, the Platte River is a classic example of a mature river. The drainage basin area of the Platte is second only to the Missouri River in Nebraska and is approximately 90,000 square miles at Plattsmouth according to the Cass County Flood Insurance Study (Reference 40). The North Platte River and the South Platte River meet to form the Platte River near the City of North Platte. The Platte River then flows the rest of the length of the State until it has a confluence with the Missouri River near Plattsmouth. Since most of the population of Nebraska lives in the eastern third of the State, most of the severe floods which have occurred on the Platte have been in eastern Nebraska. The flooding can be exacerbated by contributing streams such as the Loup River, Elkhorn River, and Salt Creek.

Dams along the North Platte River including Lake McConaughy in Nebraska have regulated flows and reduced Platte River flooding risks, especially in Western Nebraska. Lake McConaughy covers 35,700 surface acres, retains nearly two million acre-feet of water, has 105 miles of shoreline, and is a popular vacation and angling destination. Finished in 1941, the Lake serves to retain snowmelt from the North Platte headwaters in Wyoming. Several other multi-function dams on the North Platte River in Wyoming have served to reduce the severity of spring flooding. However, it should be noted that Glendo in Wyoming is the only reservoir with an authorized flood control purpose; the other reservoirs provide flood control but it is incidental to their primary purpose which is typically water supply and irrigation.

Ice jams and snowmelt are the most common cause of flooding in the Lower Platte from Columbus to Plattsmouth during the winter and early spring months. There are also more bridges which span the river in the Lower Platte because of higher levels of development and population. One of the most severe ice jam floods on the Platte occurred in March and April of 1960 in conjunction with high snowmelt flows. The entire town of North Bend was inundated. In Fremont, hundreds of people were evacuated. In Valley, an ice jam breached the Union Dike levee and forced the evacuation of several hundred residents. The National Guard Camp at Ashland was evacuated. The entire town of Waterloo was

evacuated after water flowed over Main Street north of the railroad tracks, inundating the town up to six feet deep in places.

Ice jams and snowmelt are not the only causes of floods, however. A flood event occurred along the Platte River between May 26 and June 16, 1967. Grand Island was most severely affected by this flood. Due to the Platte River flooding, water was backed up into Grand Island while Prairie Creek, Silver Creek, and Wood River were also over flood stage. Water was nearly two feet over flood stage for the Platte, which inundated about one-third of the town. Thousands of residents were evacuated and thousands more experienced property damage.

Like many of the rivers in Nebraska in 1993, the Platte River was flooded for a long period of time. In March, an ice jam and snowmelt flood destroyed a section of the Highway 64 Bridge near Valley and nearly damaged the City of Lincoln's well field, which supplies the City all water for drinking, industry, and other uses.

During 2011, the Lower Platte near it's confluence with the Missouri River was flooded for an extended period (approximately June – August) due to high water along the Missouri.

Records also show that a levee system has been installed at several locations within the Platte River watershed. These include Schuyler, Valley, Grand Island, Ashland, Ames Diking District, Gering, and Sidney.

North Platte River

The North Platte River near North Platte is regulated by Kingsley Dam and other upstream dams in Wyoming. These dams have assisted in reduction of flooding risk historically; however, during 2011 flooding impacted the River corridor due to significant snowmelt inflows that occurred in conjunction with heavy rainfall during May. Heavy snowmelt in Wyoming caused significant inflows to Lake McConaughy, which required higher than normal releases of flow from Kingsley Dam. During May and June significant flooding occurred along the North Platte River from Scottsbluff to North Platte, with the North Platte reaching a record crest of 7.69 feet. Releases from Kingsley Dam caused the North Platte River, at North Platte, to reach stages above moderate flood stage for much of the rest of the summer and into August.

Salt Creek

Flooding on Salt Creek and its tributaries typically occurs between March and September and is caused primarily by heavy rainfall over the watershed. Ten creeks converge with Salt Creek in the vicinity of Lincoln. The larger creeks of note are: Oak, Stevens, Middle, Antelope, Deadmans Run, and Haines Branch, and they combine to drain nearly 588 square miles above a point just downstream of the Stevens Creek confluence according to the Lancaster County FIS (Reference 41). Salt Creek and its tributaries have caused frequent damage in Lincoln in the past. For Antelope Creek, flood losses and risks are now greatly

reduced due to the past installation of Holmes Lake dam and recent construction of the Antelope Valley flood control project. From Lincoln, Salt Creek flows to the northeast until it empties into the Platte River near Ashland. Ashland has an extensive history of flooding because the Platte, Salt Creek, Wahoo Creek, Silver Creek, and smaller tributaries converge near the City's boundaries.

Lincoln experienced multiple flooding events in the 1950's. Flooding occurred during May of 1950 that set a record flood crest and caused significant property damages. The widespread flooding of June and July of 1951 caused millions of dollars in damage, and Lincoln recorded a new record Salt Creek crest of 26.15 feet on June 2, 1951.

The USACE built ten dams in the Salt Creek watershed during the 1960's which have had an impact on flooding risk from Salt Creek. In Lincoln, the USACE also constructed a levee system from Superior Street to Calvert Street and modified the channel of Salt Creek. This levee system provides an approximate level of protection of the 50-year flood, although this varies depending on location along the levee system. The City of Lincoln has not had a major flood along Salt Creek since these projects were completed. During 2012, finalization of a major flood control and transportation improvement project along Antelope Creek including channel improvements is being finished by the City of Lincoln, University of Nebraska, and the Lower Platte South NRD in cooperation with the USACE.

Wahoo Creek

The towns of Wahoo and Ithaca are frequently flooded by floodwater from Wahoo Creek. Wahoo Creek has a large drainage basin of 511 square miles at its confluence with Salt Creek, according to the Saunders County FIS (Reference 42). As a result, heavy rainfall in the drainage basin causes flash floods in Wahoo and downstream to Ashland. It is not uncommon for Wahoo to be isolated by floodwaters from Wahoo Creek, Sand Creek, Dry Run, and Cottonwood Creek. Recently, the Lake Wanahoo project was completed on Sand Creek just upstream of Wahoo. This dam provides a reduction in peak flood flows along Sand Creek.

Other Subregions and Flash Flooding

There are numerous other smaller channels and tributaries across the State that are vulnerable to flooding under the right circumstances. Often these locations represent short term, flash flooding risks. One example is the ten-inch rainfall event of August, 1999, which caused a Presidential disaster declaration for the counties of Douglas, Washington, and Burt. From North Omaha to Tekamah, intense rainfall led to rapid runoff as stormwater drained east to the Missouri River. As a result, one person was killed in Omaha in the Cole Creek watershed, a home was substantially damaged in Fort Calhoun, and the eastern portion of Tekamah was flooded due to ditch backwater and insufficient drainage. The

NDNR was in a fortunate position to be able to start flood mitigation plans for all three of these affected areas.

The following Figure III.2 Statewide Effective Digital Floodplain shows an overview of all digitally mapped 1% annual chance flood hazard areas in Nebraska. This map does not show areas with paper FIRM's, however, the mapping status of all counties in the State is shown on Figure IV.2 – Floodplain Mapping Status in Nebraska in Section IV.B.

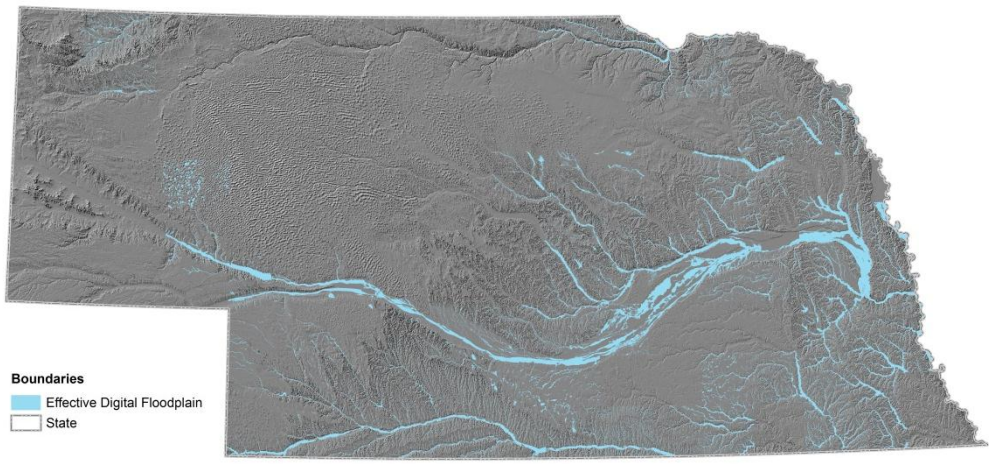


FIGURE III.2 STATEWIDE EFFECTIVE DIGITAL FLOODPLAIN

2. DAM FAILURE FLOOD RISK

Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, affecting both life and property. Flooding, earthquakes, flow blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, or terrorism can cause dam failures. Also, older dams constructed prior to the development of current design standards may not have been built in accordance with current standards and therefore may be higher risk. Dams are constructed for a variety of uses, including flood control, erosion control, water supply, hydroelectric power generation, and recreation.

Dams are classified by the State of Nebraska into four categories based on the potential risk to people and property in the event of breach. The classification of a given dam may change over time because of new development downstream of the dam. Table III.1 NDNR Dam Hazard Classification Definitions shows the hazard classifications as defined by the NDNR.

TABLE III.1 NDNR DAM HAZARD CLASSIFICATION DEFINITIONS

High Hazard *(136 Total)*	Failure expected to result in loss of life and serious damage to residential, industrial, commercial, important public utilities, public buildings, or major transportation corridors.
Significant Hazard *(195 Total)*	Failure expected to result in damage to important resources, isolated homes, moderately traveled transportation corridors, water supply systems, and other moderate commercial/business uses.
Low Hazard *(2357 Total)*	Failure expected to result in damage to minor resources such as livestock, agricultural land, and lesser used roads. Loss of human life is considered less likely.
Minimal Hazard *(137 Total)*	Failure expected to result in no economic loss beyond the cost of the structure itself and losses principally limited to the owner's property.

In the following Figure III.3 Dam Location and Classification, each colored triangle represents a dam. As is evident on the map, the majority of the state's dams are located in the southeastern portion of the state near cities or highly productive agricultural areas.

In June of 2010 major flooding caused failure of six dams in different areas of Nebraska. The dams that failed as a result of flooding include: Ericson Dam, in Wheeler County, Bredthauer Dam in Valley County, Morgan Dam in Loup County, Gracie Creek Road Dam in Loup County, Taylor-Ord Diversion Dam in Loup County, and the Ord-North Loup Diversion Dam in Valley County. Ericson Dam was classified as a significant hazard dam while the other five dams were classified as being low hazard dams. Other dams in the central portion of the state were overtopped but did not fail. Due to the number of dams that were breached or failed during this flooding event, the need to reassess the State's vulnerability to future occurrences was emphasized. However, it should be noted that no major property damages or loss of life occurred due to these dam failures. Ericson dam, reconstructed in 2012, was subsequently re-classified as a low hazard dam due to the fact that no significant damages occurred due to its failure during this storm event.

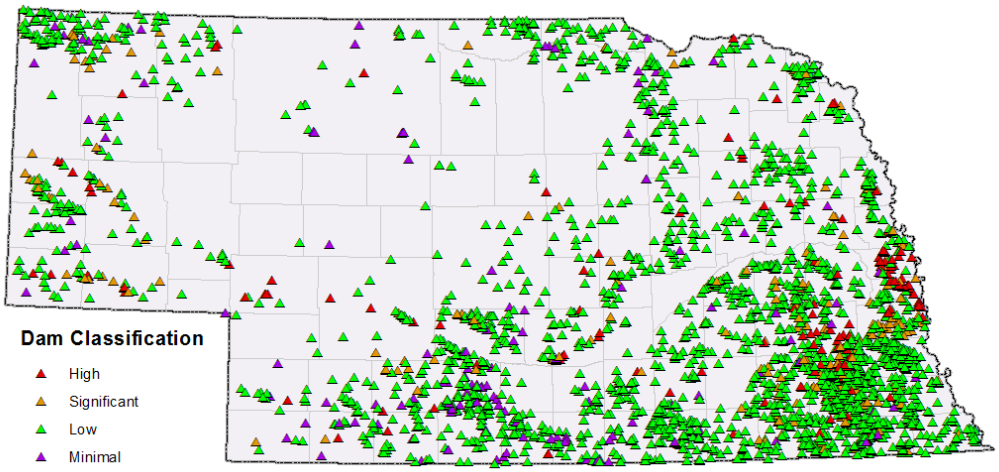


FIGURE III.3 DAM LOCATION AND CLASSIFICATION

The NDNR maintains an inventory of all dams under NDNR jurisdiction, and maintains a schedule and record of safety inspections of these dams. High hazard dams are inspected annually, significant hazard dams are inspected every three years, low hazard dams are inspected every five years, and minimal hazard dams are inspected every ten years. Owners are notified by letter of defects or deficiencies found during field safety inspections with recommended actions or directions for repair. The NDNR has the authority to require owners to correct deficiencies and defects in order that a dam be operated and maintained in a safe condition.

The following Table III.2 High Hazard Dams lists the top 30 dams in the State based on estimated total population at risk. The population data for this table was estimated using the 2010 U.S. Census blocks. The highest ranked dam is the Kingsley Dam with an estimated 139,673 persons at risk downstream in the event of failure. Failure of Kingsley dam could impact the communities and surrounding areas of North Platte, Lexington, Kearney, Grand Island, Columbus, and Fremont. It should be noted that the populations at risk shown in this table are based on estimated inundation areas; for dams in series or regional dam systems these inundation areas may overlap and due to this the approximate population at risk may be counted within more than one relevant inundation area.

TABLE III.2 HIGH HAZARD DAMS

Dam or Dam System	County (City) First Impacted by Failure	River or Stream	Population At Risk
Kingsley Dam	Keith (Keystone)	North Platte River	139,673
Oahe/Big Bend/ Ft Randall Dams (South Dakota and Nebraska)	Knox (Niobrara)	Missouri River	33,357
Seminoe/Kortes/Pathfinder/Alcova/Gray Reef/Glendo/Guernsey Dams (Wyoming)	Scotts Bluff (Henry)	North Platte River	25,464
Branched Oak/Site 18	Lancaster (Raymond)	Oak Creek	22,331
Holmes Lake/Site 17	Lancaster (Lincoln)	Antelope Creek	16,703
Pawnee/Site 14	Lancaster (Emerald)	N BR Middle Creek	16,450
Conestoga/Site 12	Lancaster (Lincoln)	Holmes Creek	14,382
Bluestem/Site 4	Lancaster (Sprague)	Olive BR Salt Creek	12,995
Wagon Train/Site 8	Lancaster (Hickman)	Hickman BR Salt Crk	10,476
Twin Lake/ Site 13	Seward (Lincoln)	S BR Middle Creek	10,126
Gavins Point Dam (alone)	Cedar (Ponca)	Missouri River	9,751
Stage Coach/Site 9	Lancaster (Hickman)	Hickman BR Salt Crk	8,217
Olive Creek/Site 2	Lancaster (Sprague)	Olive Creek	8,142
Yankee Hill/Site 10	Lancaster (Lincoln)	Cardwell BR Salt Crk	6,090
Gray Rocks Dam (Wyoming)	Scotts Bluff (Henry)	Laramie River / North Platte River	4,991
Bennington Lake Dam	Douglas (Bennington)	TR-Big Papio Creek	4,967
Papio/Zorinsky Lake	Douglas (Omaha)	Box Elder Creek	4,237
L Alice Lower Dam (NO 1 1/2)	Scotts Bluff (Scottsbluff)	Interstate Canal off N Platte R	3,407
Trenton Dam	Hitchcock (Trenton)	Republican River	3,388
Skyview Lake Dam	Madison (Norfolk)	TR Elkhorn River	2,999
Papio Site 20/ Wehrspann Creek Lake	Sarpy (Omaha)	TR-S Papio Creek	2,453
Red Willow Dam	Frontier (Indianola)	Red Willow Creek	2,371
L Alice Upper Dam (NO 1)	Scotts Bluff (Scottsbluff)	Interstate Canal off N Platte R	2,242
Medicine Creek Dam	Frontier (Cambridge)	Medicine Creek	1,951
Papio #11 Cunningham	Douglas (Omaha)	Little Papio Creek	1,777
Candlewood Dam	Douglas (Omaha)	TR- Big Papio Creek	1,700
Papio #16/ Standing Bear	Douglas (Omaha)	TR – Papio Creek	1,686
Enders Dam	Chase (Wauneta)	Frenchman Creek	1,608
Willow Creek Dam	Pierce (Pierce)	Willow Creek	1,565
Maloney Dam	Lincoln (North Platte)	Sutherland Canal off S Platte R	1,361

The three counties with the highest number of high hazard dams in Table III.2 High Hazard Dams are Lancaster County with 9 dams and up to 115,786 individuals in the inundation area, Douglas County with 5 dams and up to 14,367 individuals in the inundation area, and Frontier County with 2 dams and up to 4,322 individuals in the inundation area. Lancaster and Douglas Counties are both urban counties with a combined population of 802,517 (2010 census) or approximately 44% of the state's total population.

3. LEVEE FAILURE FLOOD RISK

Levee failure causes water to inundate normally dry areas. The failure of a levee can typically be attributed to the loss of structural integrity of a wall, dike, berm, or elevated soil by erosion, piping, saturation, under seepage, or overtopping. Levees constructed of compacted clay can be especially vulnerable due to the characteristics of the embankment soil. Levee failure risks in Nebraska can be found statewide, but are highlighted by the levee performance observations obtained during major Missouri River flood events.

Levees along the Missouri River were tested by the 1952, 1993, and 2011 floods. Although the crest passed Omaha without causing a breach during the 1952 flood, flooding was extensive along the river corridor. Data on the observed performance of levee systems in the corridor during 1952 is limited; also, some levee systems that exist today were not in place at that time. In 1993, 52 Nebraska counties were declared disaster areas under disaster number DR-998-NE due to tornados and flooding from severe storms. During the month of July in 1993, statewide precipitation set a record 8.5 inches of rainfall. The Missouri River set record crests in Plattsmouth and Brownville. River levels from Omaha to Rulo were the highest since the 1952 floods. The river from Brownville to Rulo was above flood stage for the entire month. Overtopping of a USACE constructed levee near Brownville, Missouri River Levee Unit (MRLU) R-548, threatened the Cooper Nuclear Power Plant. Fortunately the water subsided without extensive damages to the plant. During the 1993 floods several levees were overtopped or breached. Five of those levees (MRLU L-561, MRLU L-575, MRLU R-520, MRLU R-548, and MRLU R-562) are located on the Missouri River along the Nebraska-Missouri or Nebraska-Iowa borders (Reference 39).

Missouri River flooding in 2011, severely tested levees on both sides of the river between Nebraska and Iowa. Millions of dollars were spent maintaining and reinforcing levees along the Missouri, especially adjacent to Omaha, Nebraska and Council Bluffs, Iowa. The levees on the Nebraska side held, but due to multiple breaches in MRLU L-575 and MRLU L-550 widespread flooding and damage occurred in areas of southwest Iowa such as Percival and Hamburg which are across the river from Nebraska City.

In order to assess the areas at potential risk for levee failure, the National Levee Database (NLD), developed by the USACE, was reviewed. The NLD is the primary source for comprehensive information about our nation's levees.

Authorized by Congress in 2007, the NLD continues to be a dynamic database with ongoing efforts to add levee data from federal agencies, states, and tribes. Currently FEMA maintains a separate list of levees which are identified on NFIP FIRM maps. It is an objective of the NLD to combine these two data sources in the future.

The USACE Omaha District provided information summarizing the levees in Nebraska as shown in the NLD. Information provided by FEMA Region VII and obtained from FEMA FIRM maps by NDNR lists most levees shown on FIRM maps. This information was reviewed and cross referenced to develop Table 2 Levee Overview, in Appendix B. This table shows the levee or project name, FEMA R7 levee identification number, county, city (if applicable), river, approximate level of protection, and type of levee (urban or agricultural). Figure III.4 Levee Location provides an overview of the general location of most major levee systems in Nebraska. It is noted that they are mostly in the eastern third of the State with many along the Missouri River, Platte River, and the Elkhorn River watershed.

The levees listed in Table 2 were compiled from readily available data sources and likely represent only a portion of the levees that exist in the State of Nebraska. While the NLD provides a large amount of data, there is no known list or source of information that definitively encompasses all of the numerous municipal, agricultural, and other small levees. Most of the levee systems identified in Table 2 are federally constructed levees which have been handed over to local sponsors for operation and maintenance. The standards of construction vary from levee to levee in relation to their construction authorization; some levees are constructed to high levels of protection (well in excess of the 100-yr flood plus multiple feet of freeboard), while other systems were constructed to provide low levels of protection (i.e. 50-yr flood without freeboard). Similarly some systems are constructed with urban standards in mind and as such have robust drainage features (i.e. concrete culverts) and other systems are designed with agricultural purposes in mind and possess less robust features (i.e. corrugated metal culverts). Other levees shown in the table include private or local levees identified as appearing on FIRM maps.

The probability of a levee or floodwall failure is difficult to predict, because of the lack of coordinated data management on the local, State, and Federal levels. Development in a watershed can raise flood levels and make a levee designed and constructed under previous characteristics inadequate for current runoff conditions. Lack of oversight and maintenance can also lead to a higher failure risk for any levee system. Generally, improvements in levee maintenance and levee assessment and problem tracking are needed. Although levee failure risk cannot be eliminated, preventive measures such as proper maintenance, sound design, and proper construction can limit the potential for levee failure. While levee failure is likely to occur in the future, specific probabilities and potential locations for failure are difficult to pinpoint.

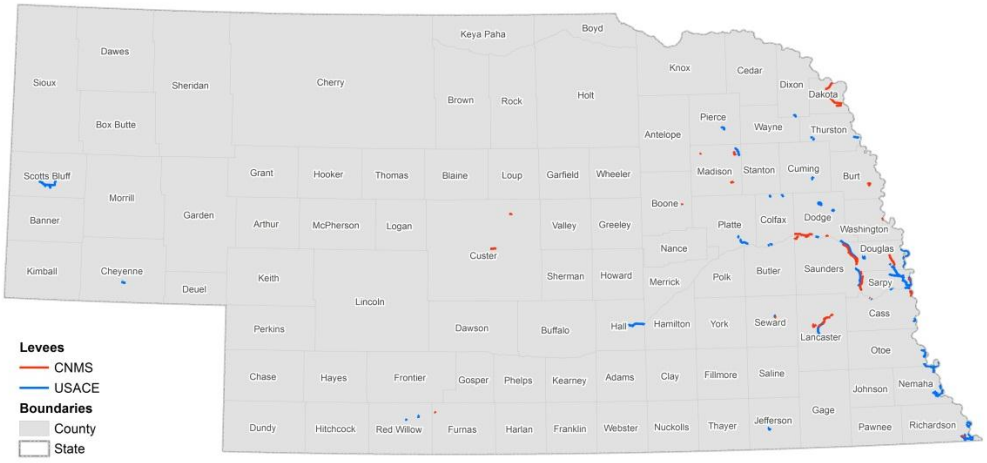


FIGURE III.4 LEVEE LOCATION

C. FLOODING VULNERABILITY ASSESSMENT

The following sections describe an assessment of Nebraska's vulnerability to flooding.

1. POPULATION TRENDS AND FUTURE FLOOD TRENDS

Considering the history of flooding in Nebraska, further hazard assessment was completed to review where flooding problems may occur in the future. One of the primary indicators is an analysis of population growth trends and population density. Typically in areas of rapid population increase there is increased development. Therefore, it is assumed that more development will take place in the counties which are experiencing the highest percentage increase in population. Historically, the eastern and southeastern portions of the State have experienced more flooding impacts than other areas within the State; this also coincides with several counties with a higher population and increasing development. Table III.3 Ten Highest Population Growth Counties, Table III.4 Ten Lowest Population Growth Counties, and Table III.5 Top Ten Populated Counties in Nebraska, show the top ten counties showing a population increase and the bottom ten counties showing a population decrease. Also shown are the most populous counties overall. The data were taken from the 2010 U.S. Bureau of the Census (Reference 43).

TABLE III.3 TEN HIGHEST POPULATION GROWTH COUNTIES

County	2010 Population	2000 Population	Percent Change
Sarpy County	158,840	122,595	29.56%
Johnson County	5,217	4,488	16.24%
Lancaster County	285,407	250,291	14.03%
Douglas County	517,110	463,585	11.55%
Hall County	58,607	53,534	9.48%
Buffalo County	46,102	42,259	9.09%
Washington County	20,234	18,780	7.74%
Garfield County	2,049	1,902	7.73%
Saunders County	20,780	19,830	4.79%
Lincoln County	36,288	34,632	4.78%

TABLE III.4 TEN LOWEST POPULATION GROWTH COUNTIES

County	2010 Population	2000 Population	Percent Change
Blaine County	478	583	-18.01%
Grant County	614	747	-17.80%
Keya Paha County	824	983	-16.17%
Banner County	690	819	-15.75%
Boyd County	2,099	2,438	-13.90%
Thayer County	5,228	6,055	-13.66%
Rock County	1,526	1,756	-13.10%
Dundy County	2,008	2,292	-12.39%
Richardson County	8,363	9,531	-12.25%
Boone County	5,505	6,259	-12.05%

TABLE III.5 TOP TEN POPULATED COUNTIES IN NEBRASKA*

County	2010 Population	2000 Population
Douglas County	517,110	28.31%
Lancaster County	285,407	15.63%
Sarpy County	158,840	8.70%
Hall County	58,607	3.21%
Buffalo County	46,102	2.52%
Scotts Bluff County	36,970	2.02%
Dodge County	36,691	2.01%
Lincoln County	36,288	1.99%
Madison County	34,876	1.91%
Platte County	32,237	1.77%
Total Population	**1,243,128**	**68.07%**

*Based on the 2010 US Census Data

A review of the counties with the highest percentage population growth shows a continuation of a trend of growth in urban areas. For the most part this also includes a population shift from agricultural areas to the cities of Nebraska. Nine of the top ten counties for percentage population growth have Nebraska's largest communities in them or are near a large community: Sarpy and Douglas Counties include portions of Omaha and other Omaha area communities, Lancaster County includes Lincoln, Hall County includes Grand Island, Buffalo County includes Kearney, and Lincoln County includes North Platte. The remaining counties are adjacent to counties with a large urban population such as Washington County near Omaha, Johnson County near Lincoln, and Saunders County between Lincoln and Omaha. Another pattern is that these general growth trends are concentrated within many counties along the Platte River corridor or along the Missouri River corridor. The only outlier to both of these patterns is Garfield County, which is in central Nebraska and is in a primarily rural area. This county was included in the highest growth counties based on percentage increase in population data but the overall population and development pressure is low relative to other counties on this list.

A review of the top ten populated counties within the State essentially supports similar conclusions but does add in several counties with other larger Nebraska communities. Scotts Bluff County includes the community of Scottsbluff which is adjacent to the North Platte River, Dodge County includes Fremont which is adjacent to the Platte River, Madison County includes Norfolk which is adjacent to the Elkhorn River, and Platte County includes Columbus which is adjacent to the Loup River and near the Platte River. Overall the counties and communities on this list encompass the majority of Nebraska's larger cities as well as the locations with the greatest growth potential, population density, and increasing development. These communities are all near a major river and potential flooding

source in Nebraska. Therefore, properties in these areas are generally more likely to be vulnerable to flooding.

The majority of rural counties are located in north central and western Nebraska. Populations in these counties are trending downwards with shifts in agricultural practices, changes in educational and employment opportunities, and other contributing factors.

2. FUTURE FLOOD PROBABILITY AND TRENDS

All floodplains pose a 1% annual chance of flooding, as identified in special flood hazard areas as part of floodplain mapping. Mitigation activities focus primarily on 1% annual chance floods.

Disasters occur because of an interaction between the natural environment and developed areas. Thus, counties with the highest population concentrations in Nebraska are typically the counties with the highest number of flood disaster declarations. The distribution of federally declared flood disasters in Nebraska from 1960 to 2012 is shown in Figure III.5 Nebraska Flood Disaster Declarations (Reference 33). From this map, it is evident that the eastern third of the State experiences the most flood disasters – this is also the portion of the State with the highest population concentrations. With the disaster history and population trends observed, it is reasonable to expect that the eastern third of Nebraska will continue to experience a disproportionately higher frequency of flood events and disasters than the rest of the State. These counties and communities also tend to be exposed to the greatest potential economic losses due to higher concentrations of critical infrastructure and housing developments.

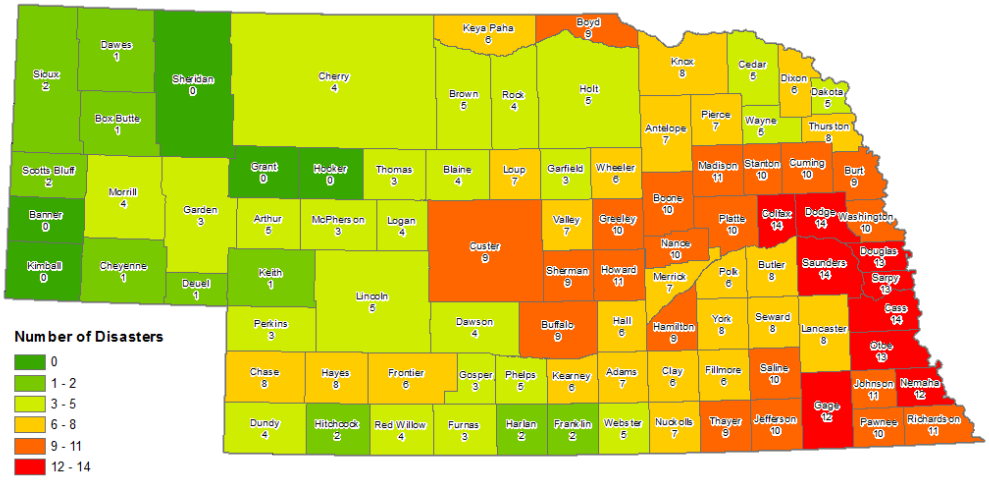


FIGURE III.5 NEBRASKA FLOOD DISASTER DECLARATIONS

3. FUTURE DAM FAILURE FLOOD TRENDS

Dam failure inundation maps for high hazard dams are developed and provided to the potentially impacted communities. However, they are typically not released by the NDNR for mitigation plan purposes. In some cases, local HMP's may include this type of information. From Figure III.3 Dam Location and Classification and Table III.2 High Hazard Dams in Section III.B.2 it can be seen that approximately 376,860 people are at risk due to being downstream of high hazard dams. While many of these risk areas are in the eastern third of the State, many are also in central and western Nebraska due to the use of impoundments such as the lake created by Kingsley Dam for farm irrigation purposes.

4. FUTURE LEVEE FAILURE FLOOD TRENDS

At this time, inundation risks from levee failure are not tracked by any one agency. Information about the failure risk is variable depending on the location of the levee system and the authorities that inspect and maintain the levee system. However, from Figure III.4 Levee Location in Section III.B.3 and Table 2 Levee Overview in Appendix B it can be seen that the majority of levees in Nebraska are in the eastern third of the State, primarily along the Elkhorn, Platte, and Missouri rivers. Specific numbers of populations protected have not been determined, although based on the location of the levees and Flood Insurance Rate Map (FIRM) data the areas protected are significant both for the protection of life and economic reasons.

D. ESTIMATING POTENTIAL LOSSES

In order to assess potential losses from flooding for the counties of the state, multiple data sources were reviewed. These included local risk assessments from local hazard mitigation plans as well as a statewide HAZUS assessment completed by FEMA in 2009 utilizing HAZUS-MH MR4 and census data from 2000 (Reference 44). It should be noted that the results of the review of local hazard mitigation plans should be used as a qualitative indicator of relative flood risk and not an absolute value for monetary risks. As of November, 2012 the majority of Nebraska's 93 counties participate in either a multi-jurisdictional or a county level hazard mitigation plan and therefore a local risk assessment was available. The counties of Cheyenne, Deuel, Grant, and Kimball are not covered by an HMP.

For local plans, methodologies for assessing potential losses varied and were not uniform. However, since most plans provide an estimate of potential losses, these were compiled in order to give a broad context to priority areas. A HAZUS assessment using additional data was completed during the development of some of the local plans; where available this information was included in the local mitigation plan review and included in this assessment of potential losses. The 2009 FEMA developed statewide HAZUS assessment is not intended to provide concrete dollar value risk information, and was used for this assessment of potential losses only for counties that do not have Hazard Mitigation Plans. It is meant to give a scale of risk from low to high. For more information on the relative risk assessment and statewide results from this HAZUS run, see the following figure III.6 HAZUS Relative Risk. In the figure, areas of higher risk

are those with higher levels of approximate total losses according to the HAZUS analysis. This figure further demonstrates that areas of higher risk for flood damages are generally concentrated in the eastern third of the State, as well as the counties of the State along the Platte River with larger communities and higher urban populations.

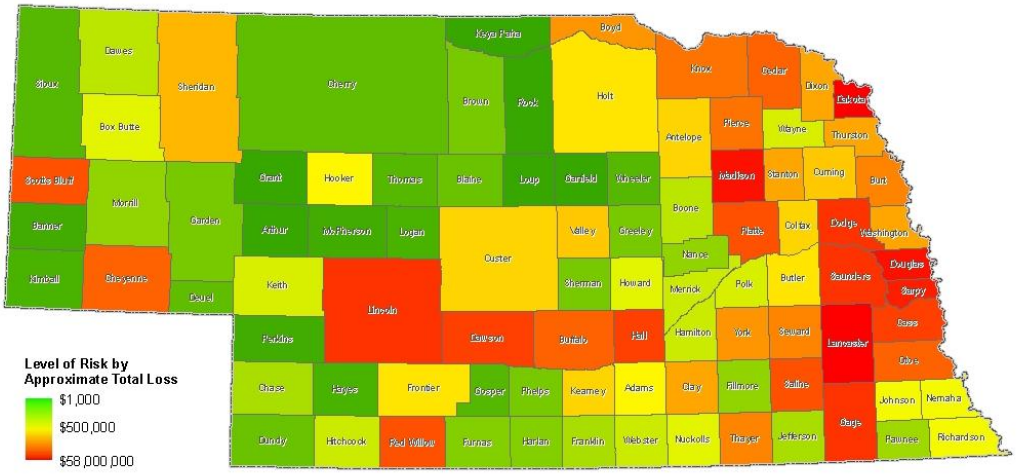


FIGURE III.6 HAZUS RELATIVE RISK

In addition to assessing potential losses, available HMP's were reviewed for the purposes of general local plan coordination. For a summary of the available plans, counties included, and potential losses as identified in the plans, see Table 3 Vulnerabilities Identified in Local Hazard Mitigation Plans located in Appendix B. This table also includes information on the priority of flooding hazards for the referenced counties as shown in the local plans, information regarding structures potentially affected, and critical facilities potentially affected for local plans that included this information. It should be noted that not all local plans prioritized flooding hazards using the same methodology; therefore each plan's results may not be directly comparable. Also, structure counts and critical facility counts were not always completed or used different methodologies. Therefore, this data may be incomplete and not directly comparable between local plans. However, this information is useful to supplement knowledge regarding overall risk trends.

Other indicators of potential vulnerability include NFIP flood insurance policy and claims data and repetitive loss data. Table 4 FEMA National Flood Insurance Program (NFIP) Policy and Claims Report, in Appendix B, summarizes the number of flood insurance policies by county, the total coverage in each county, and claims payments from 1978 to November, 2012 according to NFIP records.

Further analysis of this data provides insight into the loss trends of higher population areas in Nebraska that also correlate with areas of increasing development pressure as noted in previous sections. Table III.6 Top Ten Counties Flood Insurance Coverage shows the counties with the most coverage by dollar value in the State. Table III.7 Top Ten Counties Flood Insurance Claims Paid shows the counties with the most dollars paid

out over the reference time period. Finally, Table 5 Comparison of 2010 and 2012 NFIP Claims Data, located in Appendix B, highlights areas with increased claims and payouts between November, 2010 and November, 2012. This is of particular interest due to the widespread flooding along the Missouri River that occurred in 2011 and highlights the large increase in claims and payouts that occurred within this corridor after the flood. These occurred in Knox, Dakota, Burt, Washington, Douglas, Sarpy, Cass, Otoe, Nemaha, and Richardson Counties along the Missouri. Large increases in total payout with no increase in the number of claims were also noted in Stanton and Madison counties; the cause for this change is likely that the claims were open but not paid as of November, 2010. The reason for the losses is likely the Elkhorn River flooding of 2010.

TABLE III.6 TOP TEN COUNTIES FLOOD INSURANCE COVERAGE*

County	Total Coverage
Lancaster County	$404,961,400
Douglas County	$384,791,900
Sarpy County	$223,850,100
Dodge County	$213,539,500
Cass County	$134,275,700
Saunders County	$102,202,600
Lincoln County	$90,655,200
Platte County	$52,900,200
Buffalo County	$50,465,100
Dawson County	$49,883,400

*From 1978 – 2012.

TABLE III.7 TOP TEN COUNTIES FLOOD INSURANCE CLAIMS PAID*

County	Total Coverage
Sarpy County	$8,937,901
Douglas County	$4,010,140
Cass County	$3,159,075
Madison County	$3,099,103
Stanton County	$2,950,402
Dodge County	$2,603,567
Washington County	$2,403,017
Richardson County	$2,312,398
Saunders County	$2,145,477
Colfax County	$1,257,967

*From 1978 – 2012.

Repetitive loss and severe repetitive loss property information was obtained from FEMA during 2012 and are summarized by County below in Table III.8 NFIP Severe Repetitive

Loss Claims in Nebraska and in Table 6 NFIP Repetitive Loss Claims in Nebraska, located in Appendix B. Nebraska has approximately 354 repetitive loss properties and 6 severe repetitive loss properties, although this number is subject to change based on potential HMGP mitigation projects that may result from the flooding that occurred in 2011. It should also be noted that the repetitive loss properties list may have some inaccuracies due to lack of updates over time. Common reasons for inaccuracies include changes to jurisdictional boundaries and the status of mitigated properties not being updated within the NFIP claims database. For each individual jurisdiction this information may require further verification. However, the information is beneficial to show overall trends and locations of repetitive losses. Sarpy County, which is bordered by both the Platte and Missouri Rivers, has approximately 136 repetitive loss properties which is about 38% of the State total. Sarpy County also shows the most losses in terms of aggregate claim amounts. Other counties of note with over $1 million in total claims from repetitive loss properties include Cass which is bordered by the Platte and Missouri Rivers, Dodge which is adjacent to the Platte and Elkhorn Rivers, and Richardson which is along the Missouri River. Like these counties, most of the other counties with significant repetitive losses are located in Eastern Nebraska along the Platte, Elkhorn, or Missouri Rivers.

TABLE III.8 NFIP SEVERE REPETITIVE LOSS CLAIMS IN NEBRASKA

County*	Number of Properties	Total Number of Claims	Total Value of Claims
Dodge County	1	7	$123,011.97
Richardson County	4	19	$522,993.90
Sarpy County	1	3	$31,229.39
State Total:	**6**	**29**	**$677,235.26**

*Counties not listed have zero severe repetitive loss properties. Data covers 1978 - 2012.

It should be noted that a number of properties damaged by Elkhorn River flooding in 2010 or Missouri River flooding in 2011 are currently being assessed for potential acquisition and removal with funding assistance from the HMGP program. These mitigation projects may include repetitive loss properties; therefore this list may be modified in the future and may be reduced.

Potential losses due to dam failure are not immediately available on a statewide basis. The dam safety section of NDNR assesses risk to life safety due to dam failure, but does not assess the overall risk to structures and associated potential dollar value losses due to dam failure. For some local HMP's, dam failure risks and potential losses are provided only qualitatively, while others quantify the risk. The Papio-Missouri River NRD HMP, in particular, provides additional details regarding dam failure flooding risk within the NRD's jurisdiction (Reference 5). Due to the general inconsistency of approach to listing this information in local HMP's, a summary of the potential economic losses from dam failure is not being provided within this plan. For more information on potential losses due to dam failure, refer to the relevant local HMP.

Potential losses due to levee failure are not immediately available on a statewide basis. In general, the risk to structures and potential dollar losses for levee failure has not been assessed for most levee systems. For some local HMP's, levee failure risks and potential losses are provided only qualitatively, while a few do include information that quantifies the risk. The Papio-Missouri River NRD HMP, in particular, provides additional details regarding levee failure flooding risk within the NRD's jurisdiction (Reference 5). Due to the general inconsistency of approach to listing this information in local HMP's, a summary of the potential economic losses from levee failure is not being provided within this plan. For available information on potential losses due to levee failure, refer to the relevant local HMP.

E. STATE FACILITIES AND CRITICAL FACILITIES

A review of State facilities was completed in order to estimate potential State facility flooding losses by county. The results of the review are listed in Table III.9 Known State Facilities in High Risk Flood Areas. It lists the number of State owned buildings in the 1% annual chance floodplain by County, the total square footage of these buildings, and the total replacement cost for these structures in each county. The building data used to create the Table was provided by the Nebraska Department of Administrative Services – Building Division. These buildings are managed and operated by the following state Agencies: Nebraska Department of Administrative Services, Nebraska Department of Aeronautics, Nebraska Department of Agriculture, Nebraska Military Department, Nebraska Department of Roads, Nebraska Game & Parks Commission, Nebraska State Patrol, Nebraska Department of Health & Human Services, Nebraska Department of Corrections, Nebraska Department of Labor, Nebraska Office of the Chief Information Officer, and NDNR.

TABLE III.9 KNOWN STATE FACILITIES IN HIGH RISK FLOOD AREAS

County	# of buildings	Total Square Footage	Total Replacement Cost (in 2007 $s)
Adams County	20	396,424	$52,985,684.00
Arthur County	1	64	$1,822.00
Buffalo County	5	15,889	$2,197,835.00
Dodge County	2	2,878	$234,348.00
Douglas County	24	278,842	$58,899,181.00
Hall County	32	256,104	$54,471,843.00
Holt County	7	14,537	$500,060.00
Keith County	1	6,480	$324,431.00
Lancaster County	98	1,234,934	$126,441,888.00
Lincoln County	19	108,326	$10,567,444.00
Saunders County	11	20,453	$596,904.00
Scotts Bluff County	1	5,120	$421,097.00
Total:	**221**	**2,340,051**	**$307,642,537.00**

Critical facilities as reported in local HMP's were reviewed and are summarized in Table 3 Vulnerabilities Identified in Local Hazard Mitigation Plans located in Appendix B for plans that have this information. The type and amount of information on critical facilities varies among local HMP's and typically only facility counts are provided. Potential

dollar value losses to critical facilities are typically not explicitly addressed in local plans; therefore, this information is not summarized in this plan.

School districts are eligible to participate in local HMP's, but are not uniformly addressed in local HMP's. Risks to school districts from flooding are addressed in many local HMP's but in most cases are embedded within the overall assessment of risk and potential losses and may not be separately listed. Due to this, a summary of risks to school districts was not separately developed for the purposes of this flood mitigation plan.

Flooding risks for Public Power Districts (PPD's) are addressed within the State HMP. PPD's with a hazard mitigation plan are annexes of the State HMP. Since these flooding risks are already reflected within the State HMP, the details of the risk and vulnerability assessment for PPD's is not repeated in this plan.

IV. MITIGATION STRATEGY

A. FLOOD MITIGATION GOALS AND OBJECTIVES

The flood mitigation goals and objectives of this flood mitigation plan were developed to be consistent with the State of Nebraska Hazard Mitigation Plan, local hazard mitigation plans, and the prior (2003) Flood Mitigation Plan for the State. These goals and objectives were initially developed by the Nebraska Department of Natural Resources based on NDNR mitigation priorities. The goals and objectives were also coordinated with NEMA and the local NRDs via the draft plan review process and by NDNR review of local mitigation plans. The goals and objectives are intended to guide the development and implementation of the mitigation actions identified in the plan.

Goal 1: Reduce or eliminate long term flood risk to human life.

- Objective 1.1 – Promote and support initiatives that protect or exclude human habitation in flood zones.
- Objective 1.2 – Improve flood warning systems.

Goal 2: Reduce or eliminate long term flood risk to property and/or the environment.

- Objective 2.1 – Effective development and growth management to minimize flooding risks for new structures and to preserve the natural and beneficial functions of flood hazard areas.
- Objective 2.2 – Mitigation of flood hazards for existing structures, including repetitive loss properties.
- Objective 2.3 – Protection of State facilities and local critical facilities.

Goal 3: Promote public awareness of flooding hazards and post-flooding response.

- Objective 3.1 – Provide educational opportunities to the public to learn about flood risk awareness, floodplain management, and post-flooding response.
- Objective 3.2 – Provide educational opportunities to insurance agents, realtors, and lenders.

Goal 4: Provide technical assistance to communities, State agencies, and Federal agencies to assist with identification of flood hazards and mitigation opportunities.

- Objective 4.1 – Provide best available floodplain mapping and regulatory data for floodplain management purposes.
- Objective 4.2 – Assist communities with training and information needed to enhance floodplain management knowledge and effort.
- Objective 4.3 – Coordinate with State and Federal agencies regarding disaster response and mitigation opportunities.

B. MITIGATION ACTIONS

The Flood Mitigation Plan developed by NDNR and published in 2003 identified several mitigation actions. These actions were primarily programmatic in nature and designed to support local flood mitigation initiatives. The mitigation actions identified in the prior flood mitigation plan were reviewed for ongoing validity. Implementation progress was also assessed and has been summarized in Table 7 2003 Mitigation Plan Action Items, located in Appendix B.

As part of this plan update, NDNR has reviewed potential mitigation actions and strategies. With the 2011 State HMP update available as well as a vast expansion of available local HMP's since 2003; these sources were also reviewed in order to assess consistency of the mitigation strategies across all plans.

Finally, State and local capability assessments for flood mitigation activities were reviewed.

1. STATUS OF MITIGATION ACTIONS FROM 2003 FLOOD MITIGATION PLAN

The 2003 Flood Mitigation Plan identified several potential mitigation actions to be completed by the NDNR in cooperation with various local, State, and Federal agencies. These actions were reviewed and current status is summarized in Table 7 2003 Mitigation Plan Action Items, located in Appendix B. Since many of these actions were programmatic in nature, rather than projects at a specific location, most are partially complete and are ongoing. The relative level of completeness is noted in the table. Indicated in the Comments/Future Action column is information regarding why actions may not have been fully implemented as well as suggestions for future efforts.

Most mitigation actions from the 2003 plan have been implemented or are ongoing. One of the primary accomplishments in flood mitigation activity since the prior Flood Mitigation Plan was an increase in counties with floodplain maps accompanied by an increase in NFIP participation. This change was directly supported by Nebraska's participation in FEMA's Community Assistance Program – State Support Services Elements (CAP-SSSE) and the Cooperating Technical Partners program (CTP). An overview of the number of counties and communities that have joined the NFIP over time can be seen on the following Figure IV.1 Growth of NFIP Communities in Nebraska. The overall FIRM status for Nebraska counties as of September, 2013 can also be seen in Figure IV.2 Floodplain Mapping Status in Nebraska.

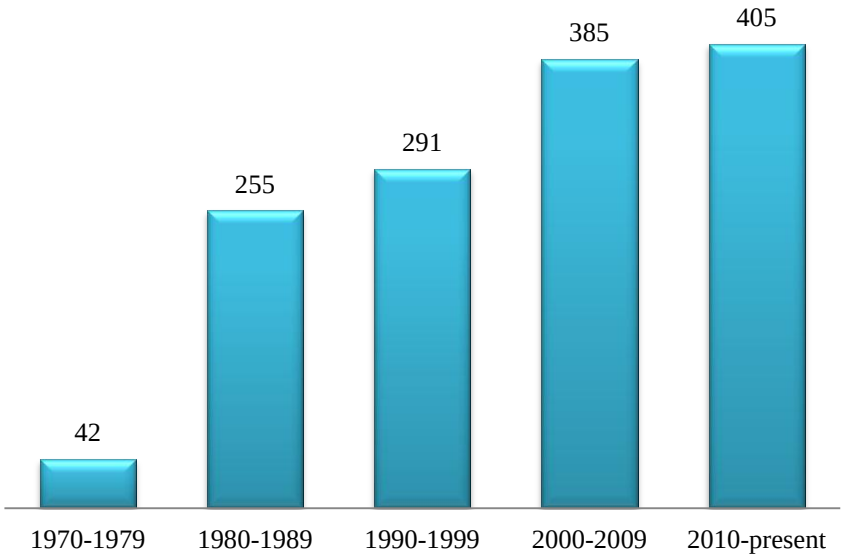


FIGURE IV.1 GROWTH OF NFIP COMMUNITIES IN NEBRASKA

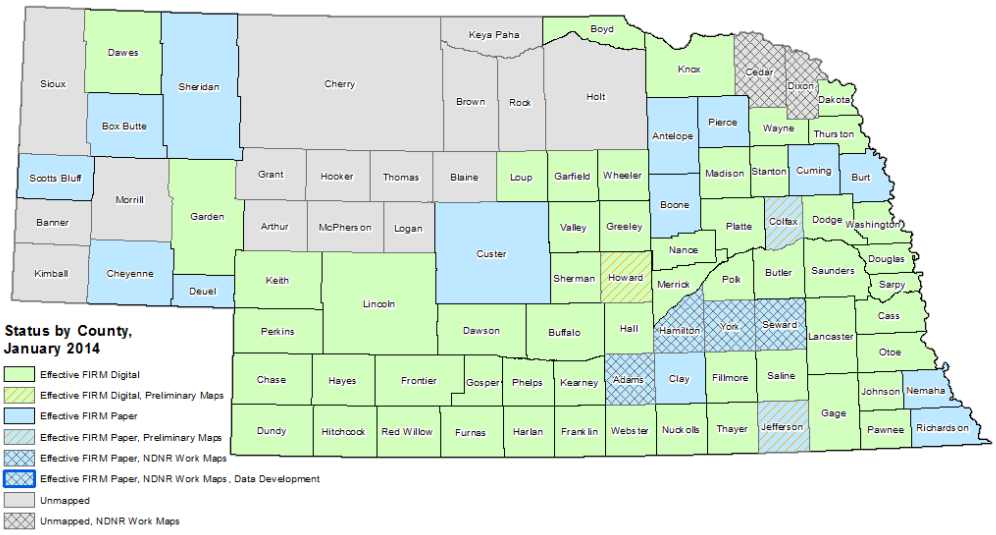


FIGURE IV.2 FLOODPLAIN MAPPING STATUS IN NEBRASKA

2. UPDATED MITIGATION ACTIONS

Mitigation actions identified in the 2003 Flood Mitigation Plan were reviewed to assess ongoing validity. In addition, the mitigation actions in the 2011 State HMP were also reviewed. Finally, NDNR ongoing programs and FEMA national initiatives were taken into consideration. Based on this information, a current summary of potential flood mitigation actions was developed. The potential mitigation actions along with corresponding goals and objectives are presented in

the Table 8 Potential Mitigation Actions, located in Appendix B. Also, the following Figure IV.3 Mapping Priorities highlights the priority areas for new floodplain mapping under floodplain mapping actions associated with objective 4.1. The NDNR's floodplain mapping priorities are further outlined in the NDNR floodplain mapping priorities business plan which is provided in Appendix F.

Potential mitigation actions shown in Table 8 were prioritized qualitatively into very high, high, and moderate priority levels. The prioritization was based on the following factors:

- Whether the action addresses hazards or areas with the highest risk, including repetitive loss areas.
- Relative cost of the action and cost effectiveness.
- Ability of State and local governments to implement the action.
- Impact of the action on prevention of loss of life.
- Impact of the action on prevention of economic and property loss.
- The extent to which the action is the most practical and effective alternative.
- The extent to which the action contributes to a long term solution.

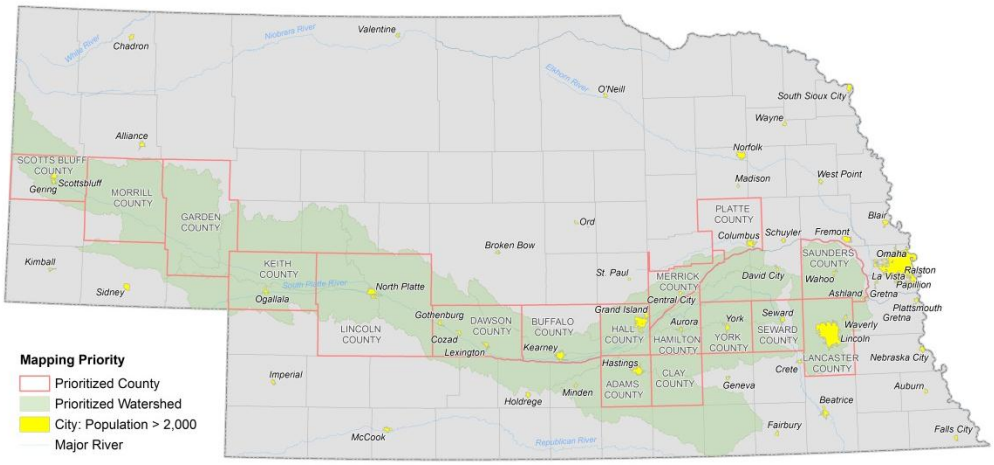


FIGURE IV.3 MAPPING PRIORITIES

Potential mitigation actions shown in Table 8 provide a summary of potential actions; these potential actions and the supporting government programs are further explained and summarized below by goal and objective. There are two FEMA programs that provide consistent support for all objectives – the CAP-SSSE program and the CTP program. CAP-SSSE provides funding for education, training, and technical assistance for communities related to all aspects of floodplain management. The CTP program provides funding for flood hazard identification via floodplain mapping and additional support for mitigation initiatives and related training. Both of these programs are support successful implementation of most of the identified mitigation actions and are important to the State's program and technical assistance efforts.

Goal 1: Reduce or eliminate long term flood risk to human life.

- Objective 1.1 – Promote and support initiatives that protect or exclude human habitation in flood zones.
  - This objective is supported by actions involving implementation of floodplain management programs and enforcement of zoning ordinances at the local level, including participation in the National Flood Insurance Program (NFIP). Participation in the NFIP, along with implementation of State of Nebraska higher standards for floodplain management has, helped mitigate flood damages over time by requiring development and building practices that reduce risk. For many communities, these objectives are also supported by comprehensive planning which can facilitate mitigation and avoidance of risk by integrating this effort into the overall planning process for the community. Generally, higher levels of zoning and growth management via implementation of comprehensive plans have been effective ways to mitigate risk.
- Objective 1.2 – Improve flood warning systems.
  - This objective is supported by actions related to assessment of risk for flooding, dam failure, levee failure, and ice jams. Improvement of flood risk information and warning systems is sometimes led at the State level (NDNR's dam safety program) but is often implemented at the NRD or local level with technical assistance potentially provided by the State.

Goal 2: Reduce or eliminate long term flood risk to property and/or the environment.

- Objective 2.1 – Effective development and growth management to minimize flooding risks for new structures and to preserve the natural and beneficial functions of flood hazard areas.
  - This objective is supported by actions involving implementation of floodplain management programs and enforcement of zoning ordinances at the local level, including participation in the National Flood Insurance Program (NFIP). Participation in the NFIP, along with implementation of State of Nebraska higher standards for floodplain management has, helped mitigate flood damages over time by requiring development and building practices that reduce risk. For many communities, these objectives are also supported by comprehensive planning which can facilitate mitigation and avoidance of risk by integrating this effort into the overall planning process for the community. Generally, higher levels of zoning and growth management via implementation of comprehensive plans have been effective ways to mitigate risk. Preservation of natural and beneficial functions of flood hazard areas is accomplished based on local and NRD priorities. Success in this area is often tied to comprehensive planning that designates flood hazard areas

for natural use, parkland, or some other use that is compatible with mitigating exposure of buildings and infrastructure to flood risk.

- Objective 2.2 – Mitigation of flood hazards for existing structures, including repetitive loss properties.
  - This objective is supported by a range of potential actions, including nonstructural and structural mitigation initiatives. Nonstructural initiatives are supported by HMGP and FMA grant funding along with local and NRD support. Structural initiatives are typically implemented by NRD's, communities, or sometimes the USACE. Providing information and education about flood hazard risks and mitigation alternatives are supported by the CTP and CAP-SSSE programs.
- Objective 2.3 – Protection of State facilities and local critical facilities.
  - This objective is supported by actions by the State to assess and record the flood risks for State facilities in the floodplain. It is also supported by local initiatives to assess flood risk for local critical facilities. Mitigation of local critical facilities may be supported by the HMGP and FMA programs along with local and NRD funding.

Goal 3: Promote public awareness of flooding hazards and post-flooding response.

- Objective 3.1 – Provide educational opportunities to the public to learn about flood risk awareness, floodplain management, and post-flooding response.
  - This objective is supported by actions involving educational outreach and technical assistance. These actions are supported by funding from NDNR, the CTP program, and the CAP-SSSE program.
- Objective 3.2 – Provide educational opportunities to insurance agents, realtors, and lenders.
  - This objective is supported by actions involving educational outreach and technical assistance. These actions are supported by funding from NDNR, the CTP program, and the CAP-SSSE program.

Goal 4: Provide technical assistance to communities, State agencies, and Federal agencies to assist with identification of flood hazards and mitigation opportunities.

- Objective 4.1 – Provide best available floodplain mapping and regulatory data for floodplain management purposes.
  - This objective is supported by actions involving development of floodplain mapping and flood hazard risk information. These

actions are supported by funding from NDNR and the CTP program.

- Objective 4.2 – Assist communities with training and information needed to enhance floodplain management knowledge and effort.
  - This objective is supported by actions involving educational outreach and technical assistance. These actions are supported by funding from NDNR, the CAP-SSSE program and the CTP program. Implementation is also supported by NRD's and communities.
- Objective 4.3 – Coordinate with State and Federal agencies regarding disaster response and mitigation opportunities.
  - This objective is supported by actions involving interagency cooperation to respond to disasters and assess post-disaster mitigation opportunities. These actions are supported by funding from NDNR, the CTP program, and the CAP-SSSE program. They are also supported by coordination with NEMA and the USACE Silver Jackets program.

The State's ultimate prioritization of the flood mitigation strategies available reflects coordination with the actions and goals communities and NRD's have identified in their local mitigation plans. Flood mitigation priorities and strategies can differ greatly in Nebraska depending on location within the State, thus NDNR helps to monitor and assist with each community's varying flood mitigation priorities. In the future, NDNR and partnering agencies will continue to assess communities' priorities against the four previously listed broad flood mitigation goals. When grant and other source funds become available for flood mitigation projects, NDNR will coordinate with mitigation plan communities and NRD's to implement projects they deem to be a priority. NDNR will also continue to work to promote mitigation actions and provide flood risk information and education through the CTP and CAP-SSSE programs.

C. NEBRASKA REPETITIVE LOSS MITIGATION STRATEGY

1. BACKGROUND

In coordination with the Nebraska Department of Natural Resources (NDNR), the State of Nebraska is providing a repetitive loss mitigation strategy that aims to reduce the number of repetitive loss and severe repetitive loss properties in Nebraska. This is being provided in order for local jurisdictions to be eligible for increased federal cost share for FEMA Flood Mitigation Assistance grants. The strategy must adhere to the following requirements from 44CFR §201.4 (c)(3)(v):

> A State may request the reduced cost share authorized under §79.4(c)(2) of this chapter for the FMA and SRL programs, if it has an approved State Mitigation Plan meeting the requirements of this section that also identifies specific actions the State has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the State intends to reduce the number of such repetitive loss properties. In addition, the plan must describe the

strategy the State has to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans.

For properties to be eligible for an increased cost share in FMA, the definitions below must apply, as stipulated in the Flood Insurance Reform Act of 2012:

A severe repetitive loss property is a structure that:

a) Is covered under a contract for flood insurance made available under the NFIP; and
b) Has incurred flood related damage –
   i. For which 4 or more separate claims payments have been made under flood insurance coverage with the amount of each such claim exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000; or
   ii. For which at least 2 separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

A repetitive loss property is a structure covered by a contract for flood insurance made available under the NFIP that:

a) Has incurred flood-related damage on 2 occasions, in which the cost of the repair, on the average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event; and
b) At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

The National Flood Insurance Program's Flood Insurance Manual provides the following definitions for NFIP and CRS purposes:

The Severe Repetitive Loss group consists of any NFIP-insured property that has met at least 1 of the following paid flood loss criteria since 1978, regardless of ownership:

- 4 or more separate claim payments of more than $5,000 each (including building and contents payments); or
- 2 or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property.

In either case, 2 of the claim payments must have occurred within 10 years of each other.

A repetitive loss structure is an NFIP-insured structure that has had at least 2 paid flood losses of more than $1,000 each in any 10-year period since 1978.

NDNR uses the different definitions of repetitive loss and severe repetitive loss properties as appropriate in any property or community's situation and application. For example, if a community is applying for FMA funds, the Flood

Insurance Reform Act of 2012 definition would apply for properties. If a community is applying for CRS and analyzing a repetitive loss strategy, the Flood Insurance Manual definition would apply for properties.

2. PREVIOUS REPETITIVE LOSS MITIGATION

- In the mid 1990's, the city of Beatrice developed a concentrated effort to buy-out and demolish repetitive loss structures in the community. From 1993 – 1996, 14 structures were mitigated and by 2008, all of the 16 repetitive loss structures in the community were demolished. The following table, taken from the City of Beatrice Hazard Mitigation Plan, summarizes the mitigated properties.

Address	Date Demolished
103 W. Court	2/20/2008
408 W. Court	12/27/1995
124 N. Bluff	4/8/1993
119 S. Center	2/15/1994
121 W. Court	2/23/2004
401 N. Lasalle	10/5/1995
425 N. 2nd St	1/12/1995
907 S. 6th St	4/8/1996
322 W. Court	10/4/1995
324 W. Court	10/4/1995
505 Cole	6/26/1996
709 Grable St	3/15/1996
823 Grable St	10/15/1995
801 S. 5th St	10/6/1995
917 S. 7th St	10/4/1995
1109 S. 9th St	10/5/1995

- The Papio-Missouri River NRD completed two sets of buyouts in the early 2000's in the Missouri River-side developments of Elbow Bend and Holub's Place in Sarpy County. Additional buyouts are being considered for future projects as a result of flooding that occurred in 2011 along the Missouri River.
- NDNR received a Flood Mitigation Assistance Grant of almost $125,000, with the village of DeWitt as a subgrantee, to install several flap gates on existing drainage structures along Highway 103. The flap gates will help reduce the potential for back flow flooding into the village when Turkey Creek experiences flooding. DeWitt has four repetitive loss properties that received benefits from this flood protection project.

3. NDNR ONGOING MITIGATION ACTIVITIES

- NDNR has taken steps to verify identifying information about the properties on the FEMA-provided repetitive loss and severe repetitive loss lists. Some of the properties have very little identifying information and communities

looking to mitigate these properties would have difficulty ascertaining correct information.

- NDNR provides technical assistance to communities looking at or currently participating in the Community Rating System (CRS). CRS Activities 501-505 require communities to address repetitive loss and severe repetitive loss properties and NDNR provides technical assistance on these activity categories if communities request.
- NDNR is currently partnering with the US Army Corps of Engineers Omaha District on a Silver Jackets project to survey every home in the villages of Cedar Creek and Louisville in Cass County. This project started in late 2013 and is project to wrap up in late 2014. There are seven repetitive loss properties in Cedar Creek and two repetitive loss properties in Louisville that will be surveyed. Through the process of surveying, all of the repetitive loss properties will have updated information that the communities can use to fill out the AW-501 "NFIP Repetitive Loss Worksheet" forms to change the repetitive loss database, if applicable.
- NDNR participates in planning teams for local All-Hazard Mitigation Plan development. NDNR provides floodplain management information, including non-private information related to a community's repetitive loss or severe repetitive loss properties, as part of the HMP planning efforts. As local communities prepare mitigation strategies, NDNR will contribute information about and encourage including repetitive loss and severe repetitive loss property mitigation into local HMP strategies.

4. NDNR'S REPETITIVE LOSS MITIGATION STRATEGY

- NDNR will continue to provide technical assistance to communities, as part of the agency's activities supported in part by CAP-SSSE. NDNR will provide assistance with floodplain management including repetitive loss definitions, grant availability and eligibility, local mitigation strategies, and repetitive loss property information verification.
- NDNR will promote CRS to communities across the state, which requires communities to evaluate and analyze repetitive loss and severe repetitive loss properties and potential mitigation alternatives. NDNR will continue to provide technical assistance on CRS Activities 501-505. By completing these activities, communities can then identify potential repetitive loss mitigation projects that could also be credited in CRS.
- NDNR administers the Flood Mitigation Assistance Grant program in Nebraska and will make projects that reduce the number of repetitive loss and severe repetitive loss properties a priority for funding. NDNR will also promote the availability of the FMA grant program to communities that might be able to benefit from applying for funding.
- As NDNR continues to participate in the local Hazard Mitigation Plan planning teams, repetitive loss and severe repetitive loss mitigation activities will be promoted as part of the mitigation strategies development.
- NDNR will continue helping communities verify correct information about the presence and location of repetitive loss and severe repetitive loss

properties. NDNR will provide updated lists to communities as the information becomes available.

D. LOCAL PLAN INTEGRATION

Local HMP's were reviewed to assess mitigation actions and priorities in local plans against those identified in the State Flood Mitigation Plan. The detailed results of this review can be found in the Detailed Summary of Mitigation Action Types from Local HMP's in Appendix G. A summary of the primary actions found in local plans as well as the number of counties with those actions identified is provided in the following Table IV.1 – Summary of Proposed Mitigation Actions from Local HMP's.

TABLE IV.1 SUMMARY OF PROPOSED MITIGATION ACTIONS FROM LOCAL HMP'S

Proposed Mitigation Action	# of Counties
Enhance Critical Facility Infrastructure	77
Evaluate Critical Facility Infrastructure	76
Enhance Emergency Management	67
Projects to Enhance Watershed Drainage	65
Public Education and Outreach Projects	64
Maintain Compliance with NFIP	63
Evaluate Emergency Management	62
Enhance Stormwater Infrastructure	60
Evaluate Stormwater Infrastructure	60
Identify High Risk Infrastructure	56
Enhance Roads and Drainage Structures	54
Acquire New Floodplain Mapping Studies, Data, or Software	52
Acquire, Relocate, Elevate, or Remove High Risk Infrastructure	51
Streambank Stabilization and Erosion Control Projects	46
Safe Room/ Storm Shelters	39
Participate in NFIP	37
Complete New or Updated Flood Risk Mitigation Studies or Plans	30
Enhance Floodplain Regulations	29
Enhance Floodplain Regulation Enforcement	27
Maintain or Enhance Floodplain Management Activities	24
Create/revise Stormwater Management Plan	23
Maintain Floodplain Mapping	18
Levee Projects	11
Enhance Stormwater Management Regulations	10
Participate in CRS	10
Floodproof High Risk Infrastructure	7
Dam Projects	6
Other Flood Control	6
Enhance Emergency Management Regulations	5

NDNR and other agencies encourage action at the local level through education about flooding risks and mitigation opportunities. NDNR also assists with facilitation of training that helps local NRD's and communities understand the benefits of mitigation. Broader participation in the NFIP's CRS program will be encouraged by providing technical assistance to interested communities. Ultimately, implementation of actions at the local level benefits from the guidance and technical assistance provided by NDNR, NEMA, local NRD's, and other agencies.

E. POTENTIAL FUNDING SOURCES

The State HMP contains a very detailed review of potential hazard mitigation funding sources for all hazards. This review is Item D under Part V of Section 4 titled 'State Capability Assessment' starting on page 4-17 of the State HMP, and is still valid. The State HMP can be found in Appendix C. A synopsis of the potentially available funding sources specific to flood mitigation projects is provided below.

The State of Nebraska does not formally have any State flood mitigation funding sources. Mitigation projects within the State usually utilize Federal mitigation money supplemented by local cost share money. Local cost share money is often provided in part by NRDs. Federal money is typically provided by an established federal grant program; in recent years the HMGP program has typically had the most available funding. The FMA program has also been instrumental in providing planning assistance, as well as providing funding for the implementation of several buyouts and flood protection projects.

The HMGP and PDM programs in Nebraska are administered by NEMA and can mitigate multiple hazards. NDNR administers the FMA program. The mitigation grant program administered by NDNR pertains only to flooding disasters. All sub-applicants of the 3 FEMA mitigation grant programs must have a FEMA-approved hazard mitigation plan to receive funding. Additionally, to receive mitigation funding, applicants and sub-applicants must demonstrate a project's cost-effectiveness via a FEMA-approved benefit-cost analysis. In order for grantees and subgrantees to be eligible for increased federal cost share in FMA, the state and local HMPs must include a repetitive loss mitigation strategy.

The programs administered by NDNR may undergo some program implementation and Federal cost share structure changed due to the NFIP reforms signed into law on July 6, 2012 that combined FMA, RFC, and SRL into the broader FMA grant program.

Lack of local match funds is a common funding issue in Nebraska and often jeopardizes implementation of mitigation projects. Few opportunities exist to utilize other Federal program dollars in local match funds; therefore, identification of multiple funding partners in order to achieve the local match is becoming increasingly necessary.

1. HAZARD MITIGATION GRANT PROGRAM

The Hazard Mitigation Grant Program is authorized under part 404 of the Robert T. Stafford Act and 44 CFR Part 206. The Purpose of the HMGP is to provide funds to states, territories, Indian tribal governments, and communities, to significantly reduce or permanently eliminate future risk to lives and property from natural hazards. The HMGP funds projects in accordance with priorities identified in state, tribal, or local hazard mitigation plans, and enables mitigation measures to be implemented during the recovery from a disaster.

In order to receive funding, all sub-applicants must have a FEMA-approved hazard mitigation plan. HMGP funds are authorized after a Presidential disaster declaration, and can be requested by the Governor of the declared state to be available in specific jurisdictions or throughout the entire state. After a Presidential disaster declaration, Nebraska is eligible for 15 percent for amounts not more than two million dollars, 10 percent for amounts of more than two million dollars and not more than ten million dollars, and 7.5 percent on amounts of more than ten million dollars and not more than approximately thirty five million dollars. Of the HMGP funds made available, the state may set aside up to seven percent of the funds received to develop FEMA-approved hazard mitigation plans, which typically include an assessment of flooding.

State agencies, Indian Tribal governments, local governments, and some Private Non-Profit organizations (PNPs) are eligible to receive HMGP funds. The state acts as the grantee for mitigation grants within Nebraska. All sub-applicants that have been identified through the NFIP as having a Special Flood Hazard Area and that have a Flood Hazard Boundary Map or a Flood Insurance Rate Map must be participating and in good standing in the NFIP. The state reviews and prioritizes sub-applications and submits the grant application with the sub-application to FEMA for review and approval within 12 months from the date the disaster was declared. HMGP funds are provided on a 75 percent federal, 25 percent non-federal cost share basis. The non-federal match does not need to be cash; in-kind services and/or other materials may be used. HMGP funds can be used for projects to protect either public or private property, as long as the project fits within state and local government mitigation strategies to address areas of risk and complies with program guidelines.

2. PRE-DISASTER MITIGATION PROGRAM

Authorized by section 203 of the Stafford Act, the Pre-Disaster Mitigation Program is a competitive grant program; providing funds to states, territories, Indian Tribal governments and communities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces the overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.

Project Grants are available for voluntary acquisition of real property (i.e. structures and land) for open space conversion; relocation of public or private structures; elevation of existing public or private structures to avoid flooding;

structural and nonstructural retrofitting of existing public or private structures to meet/exceed applicable building codes; construction of safe rooms for public and private structures; vegetation management (e.g., for wildfire); protective measures for utilities, water, and sanitary sewer systems, and infrastructure; storm water management projects; and localized flood control projects that are designed specifically to protect critical facilities and that do not constitute a section of a larger flood control system. Planning grants are available for new plan development, plan upgrades, and comprehensive plan reviews and updates. The cost share for PDM is 75-percent Federal and 25 percent non-Federal share; however, small and impoverished communities may be eligible for up to 90 percent federal cost-share.

State level agencies, including state institutions (e.g., state hospital or university); federally recognized Indian Tribal governments; local governments (including state recognized Indian Tribes and authorized Indian Tribal organizations); public colleges and universities, are eligible to apply for assistance as sub-applicants. Private nonprofit organizations and private colleges and universities are not eligible to apply to the State, but an eligible, relevant State agency or local government may apply on their behalf. The State reviews and prioritizes sub-applications and submits the grant application with sub-applications to FEMA for review and approval. All sub-applicants that have been identified through the NFIP as having a Special Flood Hazard Area and that have a Flood Hazard Boundary Map or a Flood Insurance Rate Map must be participating and in good standing in the NFIP. For project grants, all sub-applicants must have a FEMA-approved local mitigation plan by the time of the application deadline and at the time of obligation of grant funds. All activities submitted for consideration must be consistent with the local mitigation plan as well as the Nebraska Hazard Mitigation Plan.

3. FLOOD MITIGATION ASSISTANCE PROGRAM

The FMA is a program under FEMA's National Flood Insurance Program. The FMA is a FEMA program administered by the Nebraska Department of Natural Resources. Its purpose is to implement cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured under the NFIP. The FMA grant program now considers projects that were once eligible for the Repetitive Flood Claims and Severe Repetitive Loss grant programs, as these two grant programs have been eliminated.

The FMA provides planning and project grants for eligible projects to apply for. Communities can apply for planning grants to assess their flood risk and identify actions to reduce risk. Planning grants may be used to develop a new or update an existing flood mitigation plan, or the flood hazard portion of a multi-hazard mitigation plan. Project grants are available for acquisition, structure demolition, or structure relocation with the property deed restricted for open space uses in perpetuity; elevation of structures; dry flood-proofing of nonresidential structures;

and minor structural flood control activities. Planning grants are available for flood mitigation planning activities.

State-level agencies, federally recognized Indian tribal governments, and local governments including State recognized Indian tribes and authorized Indian tribal organizations are eligible to apply for assistance as sub-applicants. Individuals and private nonprofit organizations are not eligible to apply to the state, but a relevant state agency or local community may apply on their behalf. The state reviews and prioritizes sub-applications and submits the grant application with sub-applications to FEMA for review and approval. All sub-applicants must be participating and in good standing in the NFIP. For project grants, sub-applicants must have a FEMA-approved flood mitigation plan or multi-hazard mitigation plan that meets FMA planning requirements. All activities submitted for consideration must be consistent with the local mitigation plan as well as the Nebraska Hazard Mitigation Plan. FMA funds are provided on a 75 percent federal, 25 percent nonfederal cost share basis. The recipient must provide the 25 percent match, only half of which may be in-kind contributions. For repetitive loss properties, FEMA will contribute up to 90 percent of the total eligible costs, with a 10 percent nonfederal cost share. For severe repetitive loss properties, FEMA will contribute up to 100 percent of the total eligible costs if the state has taken actions to reduce the number of severe repetitive loss properties and has an approved state mitigation plan that specifies how it intends to reduce the number of severe repetitive loss properties. Recipients of FMA planning grants must produce FEMA-approved flood mitigation plans; these plans can be a flood mitigation component within an all hazards HMP. FMA funds provided cannot exceed $10 million to any State agency or $3.3 million to any community during any 5 year period of time. The state cannot exceed $20 million in FMA funds provided during any 5-year period.

4. PUBLIC ASSISTANCE 406 MITIGATION

The Stafford Act establishes the Public Assistance 406 Mitigation Program (406 Program) for the repair, restoration, and replacement of eligible damaged facilities (42 U.S.C 5172) as a result of a presidentially declared disaster. The 406 program is site specific, meaning that it must be used on an area that was directly impacted by disaster damages in a declared county within the state. Section 406 funds can only be used on projects that will directly mitigate similar damages to a structure from happening in the future. Section 406 is a Public Assistance program and follows the cost share requirements established in the Stafford Act. The minimum federal share amount is 75 percent of eligible costs. If damages have occurred on more than one occasion by the same event in a 10 year period or if the owner has failed to address the damages through mitigation actions, the federal share may be lessened to as low as 25 percent of eligible costs. As with projects under the HMGP program, all projects must be cost effective. As identified in Section 406 of the Stafford Act, mitigation measures will be determined cost effective if they do not exceed 100% of the project cost, are appropriate to the disaster damage, will prevent similar damage in the future, are directly related to the eligible damaged elements, do not increase risks or cause

adverse effects to property, are technically feasible for the hazard and location, and meet all other requirements identified in the policy. If the mitigation activity exceeds 100% of project cost, a benefit cost analysis must be performed to prove the project to be cost effective. The availability of funds under Section 406 strengthens the capabilities of the State of Nebraska and its ability to mitigate from future damages. The Nebraska Emergency Management Agency has put an emphasis on the importance of completing Section 406 mitigation in areas throughout the state.

5. OTHER FUNDS

Additional mitigation funds are potentially available from other State, local, and Federal sources; however, all of these sources may not be designated specifically for mitigation, therefore any funding may be subject to restrictions specific to the funding agency source. Below is a list of potential additional mitigation funding sources:

- Increased Cost of Compliance (ICC) coverage component of a flood insurance policy
- Natural Resources Districts (NRDs)
- Nebraska Department of Economic Development via Community Development Block Grants (CDBG)
- Nebraska Environmental Trust
- U.S. Army Corps of Engineers
- U.S. Department of Commerce, Economic Development Administration
- U.S. Small Business Administration
- U.S. Department of Housing and Urban Development
- U.S. Department of Interior
- U.S. Department of Agriculture, Rural Housing Service
- U.S. Department of Agriculture, Rural Utilities Service
- U.S. Department of Agriculture, Natural Resources and Conservation Service
- U.S. Department of Agriculture, Farm Service Administration
- U.S. Environmental Protection Agency

Specific non-FEMA mitigation funding opportunities include USACE's Flood Risk Management Program, which works toward reducing flood risk by utilizing levees, floodwalls, and alternative nonstructural mitigation practices. The Silver Jackets program, a collaborative multi-stakeholder USACE program, networks a variety of mitigation and emergency response resources. The HUD-DOT-EPA Partnership for Sustainable Communities program helps increase affordable housing, transportation, and environment protection. This integrated effort focuses on healthy, safe, and walkable neighborhood planning in rural, urban, and suburban communities; therefore, flood mitigation planning could be part of the safety planning principle of this program. The USDA's Farm Service Agency can provide Emergency Loans, which help communities recover from agriculture production and infrastructure losses due to drought and flooding. The USSBA can provide financial assistance in the form

of Home Disaster Loans, Business Physical Disaster Loans, and Economic Injury Disaster Loans. In certain situations, additional funds can be awarded by USSBA to help install mitigation improvements and protect property in the future. Further information on these and other funding opportunities can be found at https://www.cfda.gov.

F. COMMON FUNDING ISSUES AND POTENTIAL FOR PRIVATE FUNDING

The ability of local communities to provide a cost share match in mitigation projects is often limited. Many local Emergency Management Agencies forgo the opportunity to apply for grants because of a low budget in the community or other local capability factors. The participation of private organizations in mitigation projects is one way which local communities might have more opportunities to complete identified mitigation actions. This type of assistance may be beneficial to a local private entity if the mitigation effort has benefits to the entity's facilities or operations.

G. STATE CAPABILITY ASSESSMENT

A very detailed review of State hazard mitigation capabilities is provided in the State HMP in Part V of Section 4 titled 'State Capability Assessment' starting on page 4-6. This review is still valid. The State HMP is available within Appendix C. A synopsis of State agencies and capabilities specific to flood mitigation projects is provided below.

H. PRIMARY STATE PROGRAMS

The following section outlines the primary flood mitigation authorities and programs within the State.

1. NEBRASKA DEPARTMENT OF NATURAL RESOURCES (NDNR)

The NDNR has authority, by Article 10, Section 31 of the Floodplain Management Statute, for coordinating all matters pertaining to floodplain management, including State coordination with the National Flood Insurance Program. The NDNR administers the flood mitigation programs authorized by the National Flood Insurance Reform Act of 1994 and by the Flood Insurance Reform Act of 2004. NDNR contributes to state mitigation efforts by researching past flooding disasters, monitoring areas of high vulnerability, and assisting with the creation of statewide flood or all-hazard mitigation plans. The NDNR Floodplain Management Section is also responsible for floodplain mapping initiatives that result in delineation of floodplains and floodways and technical assistance to communities regarding floodplain management activities. The Legislature of the State of Nebraska has adopted minimum standards for local floodplain programs and assists cities and counties in their implementation and enforcement of those programs.

The State has a statutory responsibility to ensure that flood hazards are prevented and flood losses are minimized when state lands are used and state-owned and state-financed facilities are located and constructed. The NDNR project review process for state-financed facilities considers potential impacts to surface water rights, registered groundwater wells, and flood plain management concerns.

The NDNR maintains all of the flood-related informational resources in Nebraska. As the NFIP coordinating agency in Nebraska, the NDNR acts as a repository for floodplain data such as flood insurance studies, flood insurance rate maps, and floodway maps that are available for all Nebraska communities participating in the NFIP.

The NDNR also works closely with Nebraska's NRDs, the organizations which sponsor or assist with the funding of many mitigation projects across the state. NDNR receives federal funding via the Community Assistance Program – State Support Services Elements (CAP-SSSE) and Cooperating Technical Partners (CTP) programs. This funding supports and enhances NDNR's initiatives to help local jurisdictions with floodplain management through technical assistance, education, mitigation planning, training opportunities, and floodplain mapping. As the administrator of the Flood Mitigation Assistance (FMA) programs, the NDNR receives and approves mitigation planning grant applications, recommends projects for FEMA approval, coordinates and participates in all activities concerning flood mitigation plans, and completes all required financial and performance reports for all grants.

The Floodplain Management Section is also charged with the state responsibility for coordination and assistance with the National Flood Insurance Program (NFIP). In 1999 an agreement was made between the NDNR and FEMA through the CTP program. Through this agreement, the NDNR has been able to map unstudied areas in the State of Nebraska, providing flood hazard data that was not available before. NDNR has also created countywide work maps to complete State mapping initiatives. Even though the work maps have not been accepted by FEMA, and therefore cannot be used for Flood Insurance rating purposes, they are considered the best available data. NDNR recommends that communities with work maps use them for regulatory and planning purposes. These work maps were completed using non-federal funding sources, and future adoption of the work maps depends upon future FEMA funding. These mapping assistance programs are ongoing. The overall FIRM status for Nebraska counties as of September, 2012 can also be seen in Figure IV.2 Floodplain Mapping Status in Nebraska. A summary of programs administered by NDNR is provided below.

a) FLOOD MITIGATION ASSISTANCE (FMA) PROGRAM

In its administrative role of the FMA program, the NDNR receives and approves planning grant applications, forwards recommended projects for FEMA approval, coordinates and participates in all activities of flood mitigation plans, and completes all required financial and performance reports for all grants.

The overall goal of the Flood Mitigation Assistance program is to reduce or eliminate the long-term risk of flood damage to all types of National Flood Insurance Program (NFIP) insured structures through the use of cost-effective project grants. This will be accomplished through encouraging communities or counties to complete long-range,

comprehensive flood mitigation plans within all hazards mitigation plans. Communities will also be encouraged to develop stand-alone flood mitigation plans. Starting in FY99, FEMA declared that FMA funds used by states must be directed toward communities according to the following prioritization:

- Reducing the number of NFIP-insured repetitive loss properties with 4 or more losses;
- Reducing the number of NFIP-insured repetitive loss structures with 2 or more losses in a ten-year period, where cumulative payments have exceeded the property value;
- Reducing the number of NFIP-insured structures with substantial damage; and
- Pursuing other FMA-eligible projects which reduce future or anticipated claims against the NFIP that may not yet fall into the repetitive loss or substantially-damaged categories based on current data.

Projects must be cost effective and compliant with NEPA requirements. The most recent FMA flood risk reduction project in Nebraska was a project for the Village of DeWitt in Saline County. The project involved installation of flap gates on culverts in order to reduce frequent flooding to the Village from Turkey Creek.

NDNR administered the RFC and SRL programs in Nebraska when the grant programs were active. But, no grants under these programs had been obtained and utilized within the State. Program requirements were similar to FMA except for some variations in federal cost share structure and pre-requisites involving repetitive loss or severe repetitive loss status for the subject properties.

b) NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The NFIP was created in 1968, and the responsibilities of the NDNR for administering the NFIP are listed in State Statute 31, Section 10. The NDNR is to supply floodplain management technical assistance to communities and other interests. The NDNR will also map the floodplains of the State and conduct floodplain studies for watercourses around Nebraska. The goal of the NFIP is to reduce damages caused by flooding and to provide flood insurance.

c) COOPERATING TECHNICAL PARTNERS (CTP)

On August 19, 1999 the partnership between NDNR and Federal Emergency Management Agency (FEMA) was formalized when a Cooperating Technical Partners (CTP) partnership agreement was signed. By 2000, NDNR was actively participating in the CTP program creating effective county-wide Flood Insurance Rate Maps (FIRMs). Currently NDNR also participates in other CTP projects and provides support to

FEMA as requested. These CTP projects include on-going Risk MAP activities such as program management, Discovery, outreach, hydrology and hydraulics, floodplain mapping, LiDAR acquisition, training, and special projects like the Coordinated Needs Management Strategy (CNMS).

d) COMMUNITY RATING SYSTEM (CRS)

The CRS is a program within the NFIP which rewards participating jurisdictions by reducing NFIP flood insurance premiums in exchange for "going above and beyond" the minimum requirements for NFIP eligibility. This process reduces a jurisdiction's vulnerability to floods while reducing the cost of flood insurance premiums for all policy holders in that jurisdiction. The flood insurance premiums are adjusted to reflect reduced risk resulting from community activities that meet the three goals of the CRS: reducing flood losses, facilitating accurate insurance rating, and promoting the awareness of flood insurance.

Each community in the NFIP is automatically enrolled in the CRS as a "10". There is an established number of "points" for each activity which is determined based on the effectiveness of an activity in reducing flood damages and increasing education. Once a community accumulates 500 points, the CRS class for that jurisdiction drops by one. For each one-point drop in the CRS class, each flood insurance premium for policies in Special Flood Hazard Areas within that community drops by 5%. Thus, community leaders who wish to reduce the cost of flood insurance premiums for their community's NFIP policy holders can do so through the CRS, potentially up to 45% for a Class 1 community. Furthermore, since savings will accrue to each policy holder in the jurisdiction, there is potential for a large amount of savings in communities with a high number of NFIP policies.

Currently, there are six communities in Nebraska which are enrolled in the CRS program – Lincoln, Fremont, Omaha, Papillion, Valley, and DeWitt. Flood mitigation benefits from the CRS program in Nebraska have been well received, and nationally policies in the Special Flood Hazard Area have seen a policy savings range of 5 - 20% per year depending on the CRS class status a community maintains. NDNR will continue education and outreach activities supported by CAP-SSSE in order to bring additional flood prone communities into the CRS program, and assist the participating communities in strengthening current CRS programs.

2. NEBRASKA EMERGENCY MANAGEMENT AGENCY (NEMA)

NEMA is charged by state statute to reduce the vulnerabilities of the people and communities of Nebraska from the damage, injury and loss of life and property resulting from natural, technological or man-made disasters and emergencies. NEMA is the lead agency in the Governor's Task Force for Disaster Recovery (GTFDR). NEMA works the agencies outlined below and local governments to

pursue appropriate mitigation actions. NEMA serves as the focal point for state mitigation efforts by reviewing and monitoring mitigation projects across the State. Following a federally declared disaster, the state receives assistance for hazard mitigation. Of the total federal share of the disaster, 15 percent is earmarked for mitigation. NEMA also administers both the Pre- and Post Hazard Mitigation Grant Programs. The programs administered by NEMA, HMGP and PDM, are both described in Section 4.2.

3. GOVERNOR'S DISASTER RECOVERY TASK FORCE

Established by Governor's Executive Order 94-3, January 19, 1994 the Task Force is composed of the following State agencies: NEMA, NDNR, Department of Health and Human Services, Department of Economic Development (DED), Department of Environmental Quality, Department of Agriculture, Department of Labor, Department of Administrative Services, Game and Parks, Department of Roads and Historical Society. Selected Federal agencies such as US Army Corps of Engineers (USACE), USDA emergency organizations, US Department of Housing and Urban Development, National Weather Service, and the Environmental Protection Agency also support and participate in the activities of the Task Force. Functions are as follows:

- Insure disaster relief and recovery operations are efficiently coordinated between all agencies.
- The Task Force will make a detailed examination of all features of State recovery efforts including hazard mitigation grant projects with emphasis on the efficient utilization of the resources made available by the Federal supplementary appropriations.
- NDNR and NEMA jointly co-chair the Task Force.

4. NATURAL RESOURCES DISTRICTS (NRDS)

The NRDs are governmental entities, and sponsor or help fund many mitigation projects across the state. In 1972, the Nebraska Legislature combined 154 special purpose entities into 23 NRDs. Unique to Nebraska; NRDs protect the state's natural resources. The boundaries of most NRDs are typically formed by major Nebraska river basins, although some variations do occur. Since their statutory authority includes flood control, most of the projects are for flood mitigation. The 23 NRDs in Nebraska help respond to natural resource challenges throughout the state, and assist in the building of relationships with other partnering agencies and organizations. The NRDs share the same responsibilities as the State of Nebraska, however, priorities are set and programs are developed to best serve the local needs. NRD flood mitigation and land erosion projects are often done by the individual NRD or in cooperation with local jurisdictions. Since the 2008 State HMP update, NRDs throughout the state have applied for and been awarded hazard mitigation grant money through both the Hazard Mitigation and Pre-Disaster Mitigation Grant Programs. NRD's have also served as a conduit for coordinating a number of multi-jurisdictional multi-hazard mitigation plans within

the State. For an overview of the NRD system refer to Figure II.1 Natural Resources Districts in Section II.C.

5. NEBRASKA DEPARTMENT OF ECONOMIC DEVELOPMENT (DED)

Created by the legislature in 1967, the DED is the official lead economic development agency for Nebraska. DED administers the Community Development Block Grant (CDBG) program, which provides annual direct grant to states. These grants are awarded to communities for use in revitalizing neighborhoods, expanding affordable housing and economic opportunities, and improving community facilities and service. The CDBG program is designed to benefit low- and moderate-income individuals and families. These funds are available for use in pre-disaster mitigation projects. CDBG funds may also be used to offset the 25% local share match on all FEMA approved Hazard Mitigation Grant Program Projects.

I. PROGRAMS ADMINISTERED BY OTHER STATE AND FEDERAL AGENCIES

This section outlines mitigation programs administered by other agencies.

1. U.S. ARMY CORPS OF ENGINEERS (USACE)

The USACE reduces risk to the public, property, and the environment by providing direct and technical assistance to communities. USACE develops and interprets flood and floodplain data. USACE studies all aspects of flooding and provides this information to mitigation planners for the State of Nebraska. Mitigation projects require consultation with the USACE to obtain clearance before moving forward in order to comply with Executive Order 11988 (Floodplain Management), The Clean Water Act, Rivers and Harbors Act, and Executive Order 11990 (Protection of Wetlands). The 2009 USACE National Flood Risk Management Program Initial Guidance dated October 9, 2009 identifies a Flood Risk Management Cycle. The cycle starts with preparation and training, moves on to response, then to recovery, finally to mitigation activities, and begins again with preparation and training. For more information on the Flood Risk Management Cycle, please see the USACE Flood Risk Management Cycle website at http://www.nfrmp.us/resp_Fed.cfm (Reference 45). A cycle such as the one identified, is an example of the ongoing attempts to better improve preparedness, response, recovery, and mitigation. Several programs and potential funding authorities are available through the USACE:

- Floodplain Management Services - Flood and flood plain data are developed and interpreted. This includes information on flood hazard mitigation, flood proofing, flood formation and timing, flood depth or state, floodwater velocity, extent of flooding, duration of flooding, flood frequency, obstruction to flood flows (including ice jams), regulatory floodways, flood loss potentials before and after employment of flood plain management measures, and comprehensive flood plain management planning. On a larger scale, the program provides assistance and guidance in the form of detailed studies on all

aspects of flood plain management planning. Some of the most common types of studies include the following:

- Floodplain delineation and flood hazard evaluation studies
- Flood damage reduction and mitigation studies
- Dam break analysis
- Urbanization impact studies
- Flood warning and preparedness studies
- Stormwater management studies
- Regulatory floodway studies
- Flood proofing studies
- Comprehensive floodplain management studies
- Inventory of flood-prone structures
- Non-structural flood damage reduction studies

- The Section 22 Program is a study-level program which can be used for the development of flood mitigation plans. The program requires a 50% cost share from a non-federal sponsor. In kind services can be used to provide the local share.
- Section 205 Flood Damage Reduction Program can be used to study flooding problems in urban areas, towns, and villages. If a federal interest is found during the initial phase of the study, this program is authorized to design and build flood damage reduction remedies. There is a requirement for non-federal sponsor cost share through the various project phases.

2. NEBRASKA GAME AND PARKS COMMISSION (NGPC)

The NGPC is governed by a board of Commissioners appointed by the Governor of Nebraska. A director is then elected by the commissioners for a six year term. The mission of the Nebraska Game and Parks Commission is "stewardship of the State's fish, wildlife, park, and outdoor recreation resources in the best long-term interests of the people and those resources." In order to accomplish their purpose, the Commission efficiently and objectively plans and implements its policies and programs. The NGPC coordinates all disaster operations, including damage assessment, conducted in state-owned parks, recreation, and wildlife areas. The NGPC also provides lifesaving small boat operations during floods and works as a cost sharing organization for projects that benefit the state. The NGPC also awards and administers the Environmental Trust Grants that can be used by local jurisdictions for mitigation projects. For mitigation projects, consultation is completed with the NGPC to obtain environmental clearance before moving forward with mitigation projects in order to comply with all environmental laws and policies including The Endangered Species Act and The Fish and Wildlife Coordination Act.

3. NEBRASKA DEPARTMENT OF ROADS (NDOR)

The NDOR is in charge of all the roads and bridges in the State of Nebraska, making their role in mitigation planning crucial. Following disasters, the NDOR aids in debris cleanup and repairs any damaged roads or bridges. Funding for these repair projects comes from the state and federal highway programs. During the planning and construction phases, procedures are implemented to avoid adverse impact to streams, floodplains, or lakes. While the NDOR has no funding programs, meetings are held to ensure these projects will not cause flooding problems in the affected jurisdictions. Since contractors handle road-building projects, any flooding caused by incomplete drainage facilities or channels is the responsibility of the contractor.

4. NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The NFIP was created in 1968 by Congress to help protect local property owners financially from flooding by providing flood insurance to businesses, renters, and homeowners if their community is a participant in the NFIP. Currently, Nebraska has approximately 13,300 policies in force representing over $2.1 billion worth of coverage. FEMA administers the NFIP and the rates do not differ between insurance agencies. Rates are dependent on the type of construction of the home as well as the date it was built. Rates are also dependent upon the building's level of risk to flooding. FEMA makes flood insurance available to those communities that have decided to participate in the NFIP. Those communities that choose to participate must agree to adopt and enforce all regulations and ordinances on floodplain management as required by the program. In order for a community to receive Hazard Mitigation Assistance monies the community must be in good standing with the NFIP. One of the strengths of the program has been keeping people away from flooding through floodplain management requirements rather than keeping the flooding away from people through structural flood control.

J. LOCAL CAPABILITY ASSESSMENT

Through working with NFIP participating communities and coordinating with NEMA regarding mitigation project review and implementation efforts, the NDNR has developed an understanding of local flood mitigation capabilities. It has been found that local capabilities for flood mitigation vary widely across the State. This variability is largely due to population levels, which have a direct impact on funding levels. The larger population regions of Lincoln and the Omaha area have the most resources, followed by mid-size cities such as Norfolk, Columbus, Fremont, Grand Island, Kearney, North Platte, and Scottsbluff. Many smaller communities and counties have limited resources for emergency management and floodplain management efforts, including mitigation projects. For this reason, implementation of mitigation projects in certain areas tends to be difficult, due to lack of both financial and personnel resources. Generally, the areas with lower populations tend to have lower resources; this includes (but is not necessarily limited to) rural areas of the State, which are typically north and south of the Platte River corridor in central and western Nebraska. It also includes many areas along the Missouri River corridor in northeastern and southeastern Nebraska.

The majority of communities with flood hazard mapping implement some level of floodplain management, which at a minimum includes NFIP participation and adherence to State minimum standards for floodplain management programs. Many communities across the State also implement some level of building and zoning code and/or development planning requirements. A good portion of communities participate in a hazard mitigation plan, typically a multi-jurisdictional plan covering a county, multiple counties, or an entire NRD. However, based on review of adopted HMP's, the level of flood mitigation assessment and mitigation action development within the plans is low for many individual communities.

A few communities with additional staffing resources or that place an importance on floodplain management at the local level have a higher level of dedicated floodplain management staff and may currently participate in the NFIP CRS program. The CRS communities include Lincoln, Papillion, Omaha, Fremont, Valley, and DeWitt.

NRDs often serve to assist communities with development and implementation of mitigation projects. Levels of assistance vary depending on financial and staffing resources. In some cases, the NRD may serve as the primary contact within the region for floodplain management and mitigation assistance. In most cases if a cost effective flood mitigation project were to be available to a community, the NRD would assist in any way possible. This assistance is often very helpful to moving mitigation projects forward that may otherwise be unlikely to achieve implementation. NDNR helps communities understand definitions of repetitive loss and severe repetitive loss structures and prioritizes assisting in mitigation activities related to these structures.

Overall, flood mitigation projects that have been implemented to date have been very successful; however, due to funding and staffing constraints the ability to implement mitigation projects at the local level is often low. This capability, therefore typically must be supplemented by funding assistance from the regional NRD, as well as technical assistance from State authorities including NDNR and NEMA.

V. COORDINATION OF LOCAL MITIGATION PLANNING

A. LOCAL FUNDING AND TECHNICAL ASSISTANCE

The majority of local mitigation planning funding assistance in recent years has been provided by NEMA through the HMPG and PDM programs. These efforts are described within the 2011 State Hazard Mitigation plan starting on page 5-1. The State HMP is available within Appendix C.

NEMA and NDNR have consistently provided technical assistance for local flood mitigation planning by participating in the planning process for the multi-jurisdictional hazard mitigation plans implemented across the State. NEMA and NDNR also routinely coordinate to provide training opportunities to local communities covering all aspects of mitigation, including mitigation plan development and mitigation project development topics such as benefit/cost calculation.

B. LOCAL PLAN INTEGRATION

The process for integrating local plans with the State Hazard Mitigation Plan is described in the State HMP in part III of Section 5 – Coordination of Local Mitigation Planning which begins on page 5-3. In general, most procedures for review of local mitigation plans and incorporation of findings from local plans into the State HMP are developed by NEMA. The process for general play review is provided on page 5-11 of the State HMP, while the process for plan linking and integration is discussed on page 5-13. NDNR assists NEMA with review of the plans and implementation of the planning process.

For the purposes of this flood mitigation plan, NDNR had access to numerous local HMP's that were not available during the development of the 2003 flood mitigation plan. These HMP's cover nearly all counties in Nebraska. NDNR utilized these plans to obtain more detailed information regarding local risk assessments and mitigation priorities. This information was then utilized for the development of this plan. Since this was the first time these plans have been available in a comprehensive format for review for flood mitigation planning purposes, NDNR had not previously developed a systematic approach for review of this information. NDNR was able to review the plans and excerpt key information for compilation into some of the data presented within this plan. This created a baseline of plan data that can be referenced and updated with any updated local plan data during future State HMP updates.

C. PRIORITIZING LOCAL ASSISTANCE

The process and criteria for prioritizing local assistance is described within the State HMP in part III of Section 5 – Coordination of Local Mitigation Planning starting on page 5-7. Generally, the criteria prioritize mitigation planning and flood risk reduction projects according to level of flood risk mitigated and the economic and population impact. Priority is given to areas with higher levels of population growth and development pressure. For example, a repetitive loss or other high risk area would be a high priority. Areas of high population or high loss reduction impact are also a high priority.

For flood mitigation projects, NDNR follows procedures and criteria similar to those established and followed by NEMA. These are provided on pages 5-8 through 5-11 of the State HMP. For FMA projects, there may be additional criteria considered based on requirements of those grant programs.

VI. PLAN IMPLEMENTATION AND MAINTENANCE PROCESS

A. PLAN MONITORING, EVALUATION, AND UPDATING

This Flood Mitigation Plan establishes the flood mitigation goals and objectives of the NDNR. It is expected that this plan document will be incorporated into the 2014 State HMP update. In the Nebraska State HMP, NEMA has established detailed procedures for plan monitoring, evaluation, and updating within Section 6 of that plan starting on page 6-1. This process establishes annual review meetings each June to review the status of the elements of the State HMP and evaluate any needed changes to the plan. This process also establishes the potential for additional meetings and plan assessment as needed or in response to a disaster declaration. As a member of the GTFDR, NDNR will participate in the State HMP monitoring and evaluation process and provide feedback as requested.

In addition to this process, NDNR has dedicated mitigation staff that routinely monitor flood mitigation activities across the State. As these activities are developed via mitigation planning by local or NRD authorities, NDNR is typically involved in an advisory capacity. This role allows NDNR staff to maintain general awareness of local flood mitigation priorities and projects within the State. Since most flood mitigation projects within the State are currently funded via the HMGP program administered by NEMA, NDNR mitigation staff also assist NEMA with flood mitigation project application assessment and selection for funding.

As a supplement to the State HMP monitoring process, periodically NDNR will complete additional evaluation and monitoring of the State Flood Mitigation Plan. The Flood Mitigation Plan will be evaluated to ensure it is still current and no changes are required. Basic evaluation criteria will include:

- Whether goals and objectives of the plan are still relevant.
- Any changes to the nature or severity of flood hazards and risks.
- Whether flood mitigation actions that meet the plan goals and objectives are being completed.
- Changes to State or local flood mitigation capabilities.
- Effectiveness of flood mitigation actions.
- Assessment of adequacy of plan implementation resources.
- Assessment of any implementation problems.

This evaluation will be completed by NDNR mitigation staff in coordination with NDNR floodplain management section staff, NEMA, other State or Federal agencies, NRD's, and local authorities as needed.

The plan will also be evaluated and updated following a major flooding disaster or as needed. Examples of when the plan may be evaluated and updated on an as-needed basis include: significant new regulations enacted at the Federal or State level that impact mitigation programs or priorities, or other circumstances that dictate changes to the State's flood mitigation priorities.

NDNR staff will also coordinate with authorities implementing flood mitigation activities and will continuously monitor and track activity progress and status. This information will be maintained at NDNR and will be used as part of the plan monitoring, evaluation, and update process.

B. MONITORING PROGRESS OF MITIGATION ACTIVITIES

In Nebraska, flood mitigation projects are typically undertaken by local or NRD authorities with oversight and technical assistance from NEMA or NDNR. Mitigation education and program initiatives are typically undertaken at the State level by NEMA or NDNR, with input and participation from NRD or local authorities.

In recent years, the majority of flood mitigation action projects have been completed using HMGP funds administered by NEMA as the primary non-local funding mechanism. Due to this, these projects are administered and tracked via NEMA's established processes. These processes are described fully in Part IV of Section 6 starting on page 6-6 of the State HMP.

For other flood mitigation activities completed under funding authorities such as the FMA program or the local NRD, NDNR will monitor and record the results of mitigation actions. NDNR will provide technical assistance and floodplain data as necessary. NDNR will also assist the community with updates to the repetitive loss list if repetitive loss or severe repetitive loss properties are mitigated by the project. Finally, NDNR will encourage communities to join the CRS program and will monitor participation and progress of the current CRS participants.

VII. REFERENCES

1. *Nebraska State Hazard Mitigation Plan*. Nebraska Emergency Management Agency, 2011.
2. Nebraska Water Fun Facts—Nebraska Water Center Web Site: http://watercenter.unl.edu/archives/Pre2004/Nebraska%20Water%20Fun%20Facts.pdf
3. National Climatic Data Center – Storm Events Database: http://www.ncdc.noaa.gov/severe-weather
4. *Cedar and Dixon Counties, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., April 2010.
5. *Multi-Hazard Mitigation Plan For the Papio-Missouri River Natural Resources District*. Olsson Associates and AMEC, July 2011.
6. *Antelope, Holt, and Knox Counties, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., July 2010.
7. *Lower Elkhorn Natural Resources District, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., June 2009.
8. *Lower Platte North Natural Resources District, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., March 2010.
9. *Lower Platte South Natural Resources District, Nebraska, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., November 2008.
10. *Nemaha Natural Resources District, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., February 2010.
11. *Region 24 Emergency Management, Multi-Jurisdictional Hazard Mitigation Plan.* JEO Consulting Group, Inc., August 2010.
12. *Lower Loup Natural Resources District, Draft Multi-Jurisdictional Hazard Mitigation Plan.* Kirkham Michael, May 2012.
13. *Central Platte Natural Resources District, Multi-Jurisdictional Hazard Mitigation Plan.* Kirkham Michael, December 2011.
14. *Hall County All-Hazards Mitigation Plan*, Nebraska Department of Natural Resources and U.S. Army Corps of Engineers, September 2008.
15. *Hamilton County, Nebraska, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., August 2009.
16. *York County, Nebraska, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., November 2009.
17. *Seward County, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., December 2008.
18. *All-Hazards Mitigation Plan for the Lower Big Blue Natural Resources District and the Little Blue Natural Resources District*, Olsson Associates, December 2010
19. *Upper Loup Natural Resources District, Multi-Jurisdictional Hazard Mitigation Plan.* JEO Consulting Group, Inc., August 2009.
20. *Twin Platte Natural Resources District, Multi-Jurisdictional Hazard Mitigation Plan.* Kirkham Michael, August 2011.
21. *Perkins County, Nebraska, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., July 2009.

22. *Chase County, Nebraska, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., January 2010.
23. *Dundy County, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., July 2010.
24. *Frontier County Multi-Jurisdictional All-Hazards Mitigation Plan,* West Central Nebraska Development District, Inc., October 2008.
25. *Hayes County, Nebraska, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., September 2009.
26. *Hitchcock County Hazard Mitigation Plan,* West Central Nebraska Development District, Inc., August 2010.
27. *All-Hazards Mitigation Plan for the Tri-Basin Natural Resources District,* Olsson Associates, December 2011.
28. *Franklin, Furnas, Harlan, and Red Willow Counties, Multi-Jurisdictional Hazard Mitigation Plan*. JEO Consulting Group, Inc., December 2009.
29. *Region 23 Emergency Management, Multi-Jurisdictional Hazard Mitigation Plan.* JEO Consulting Group, Inc., January 2010.
30. *North Platte Natural Resources District, Hazard Mitigation Plan.* JEO Consulting Group, Inc., March 2011.
31. *Gage County, Nebraska Flood Insurance Study*. Federal Emergency Management Agency, June 18, 2010.
32. U.S. Army Corps of Engineers Web Site – National Levee Database: http://nld.usace.army.mil/egis/f?p=471:1:0::NO
33. FEMA Web Site – Disaster Declaration Summaries: http://www.fema.gov/disasters/grid/state/68
34. Wilmot, Marlene Harvey. *Bluff-to-Bluff, too! The 1935 Republican Valley Flood,* 1996.
35. Wilmot, Marlene Harvey. *Bluff-to-Bluff: The 1935 Republican Valley Flood*, 1995.
36. Hoffman, Rocky. *River Portraits: The Republican*. 1983. Nebraska Rivers, v. 61, #1 (January-February): 58-65.
37. NOAA Web Site – Republican River Flood of May 30, 1935: http://www.crh.noaa.gov/gld/?n=1935flood-flood
38. *Otoe County, Nebraska Flood Insurance Study*. Federal Emergency Management Agency, February 18, 2011.
39. *Midwest Flood – Information on the Performance, Effects, and Control of Levees*. U.S. General Accounting Office, August, 1995.
40. *Cass County, Nebraska Flood Insurance Study*. Federal Emergency Management Agency, November 26, 2010.
41. *Lancaster County, Nebraska Flood Insurance Study*. Federal Emergency Management Agency, February 18, 2011.
42. *Saunders County, Nebraska Flood Insurance Study*. Federal Emergency Management Agency, April 5, 2010.
43. U.S. Census Bureau Web Site - http://www.census.gov/
44. FEMA State-Wide HAZUS Data, Federal Emergency Management Agency, April 03, 2012.
45. USACE Flood Risk Management For Federal Partners Web Site – http://www.nfrmp.us/resp_Fed.cfm

46. NOAA National Weather Service River Observations Web Site - http://water.weather.gov/ahps/region.php?state=ne
47. USGS Nebraska Water Science Center Web Site - http://ne.water.usgs.gov/

APPENDIX A

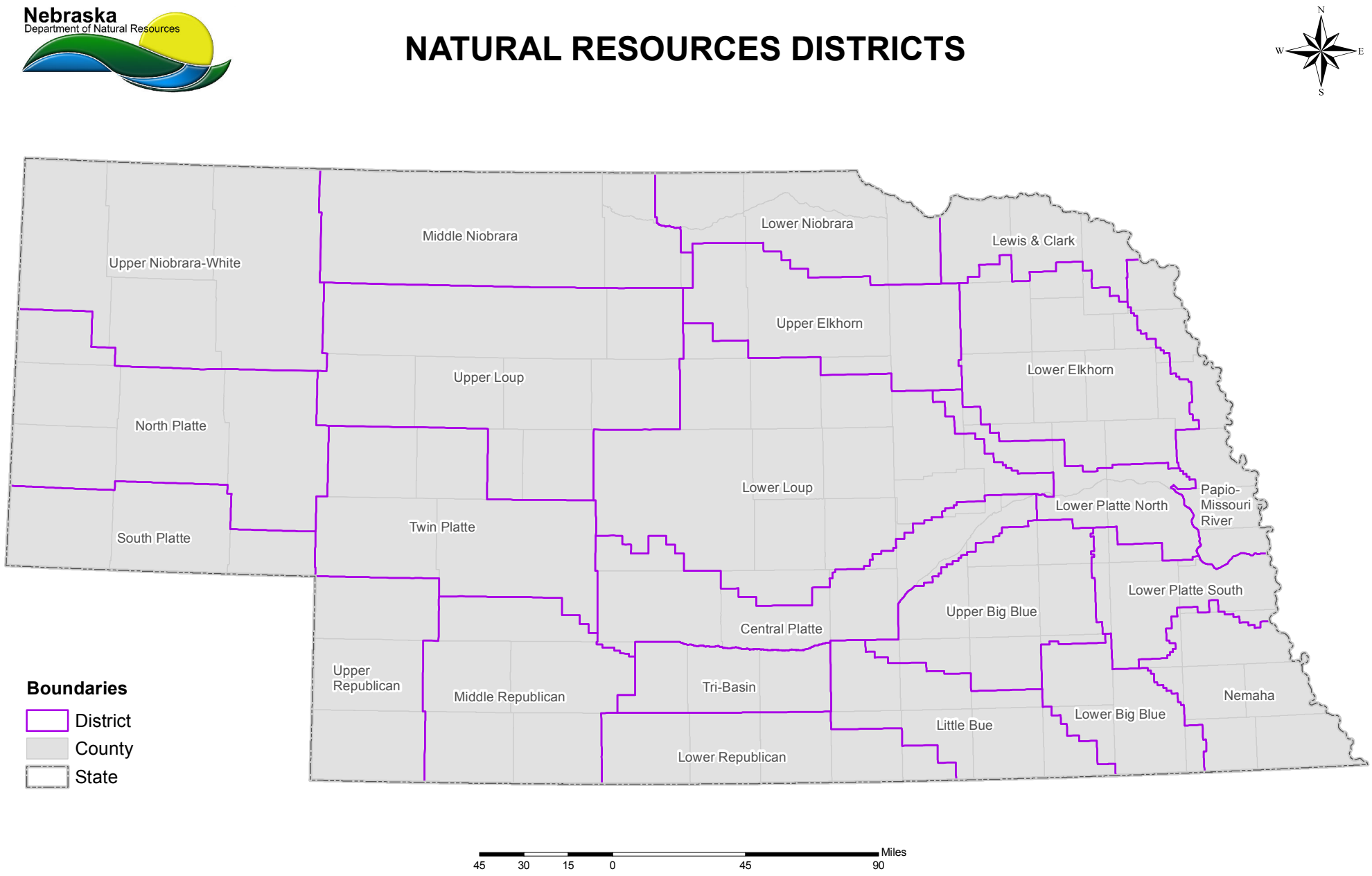


Figure II.1. Nebraska Natural Resources Districts

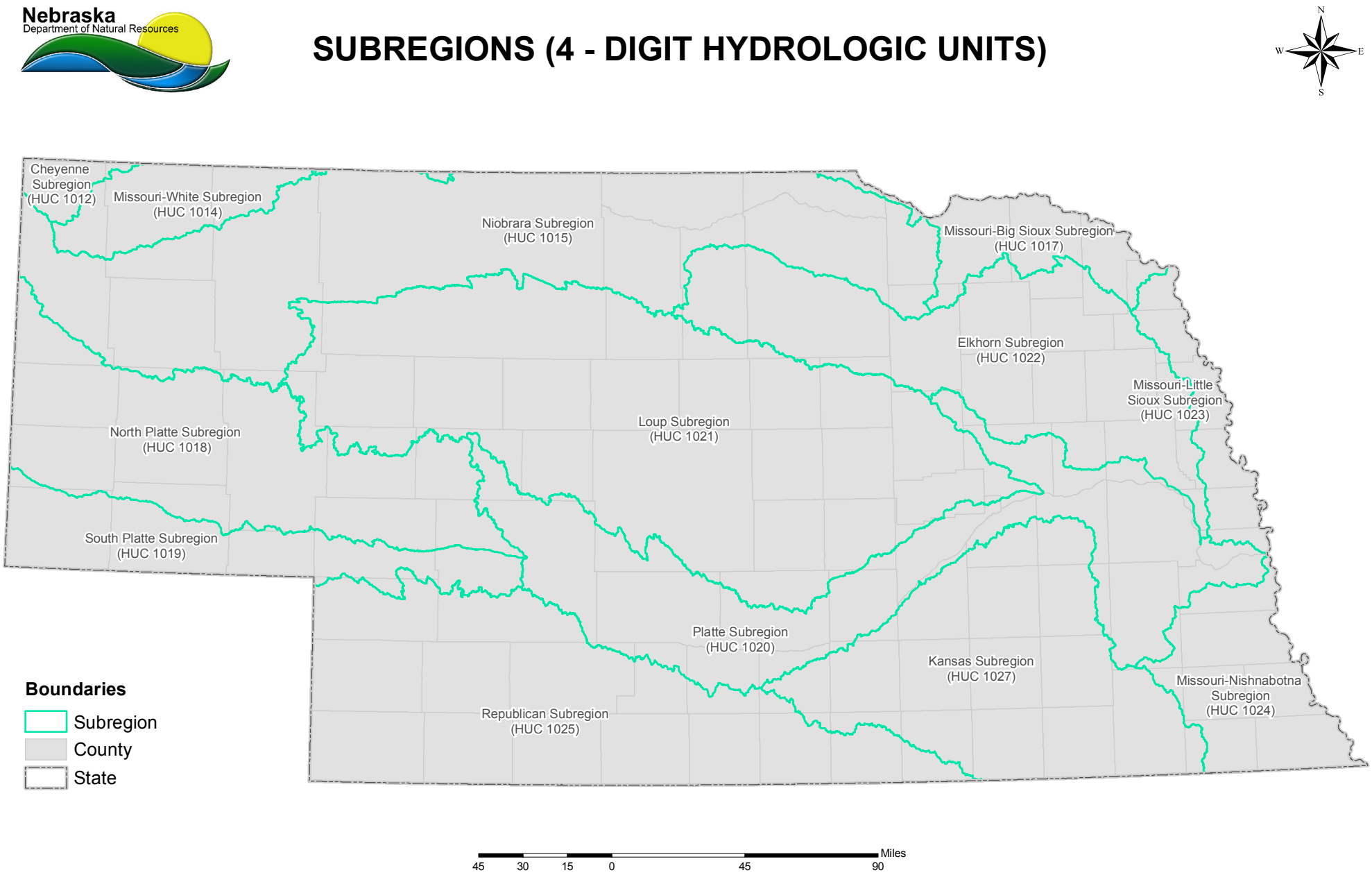


Figure III.1. Subregions (4 - Digit Hydrologic Units)

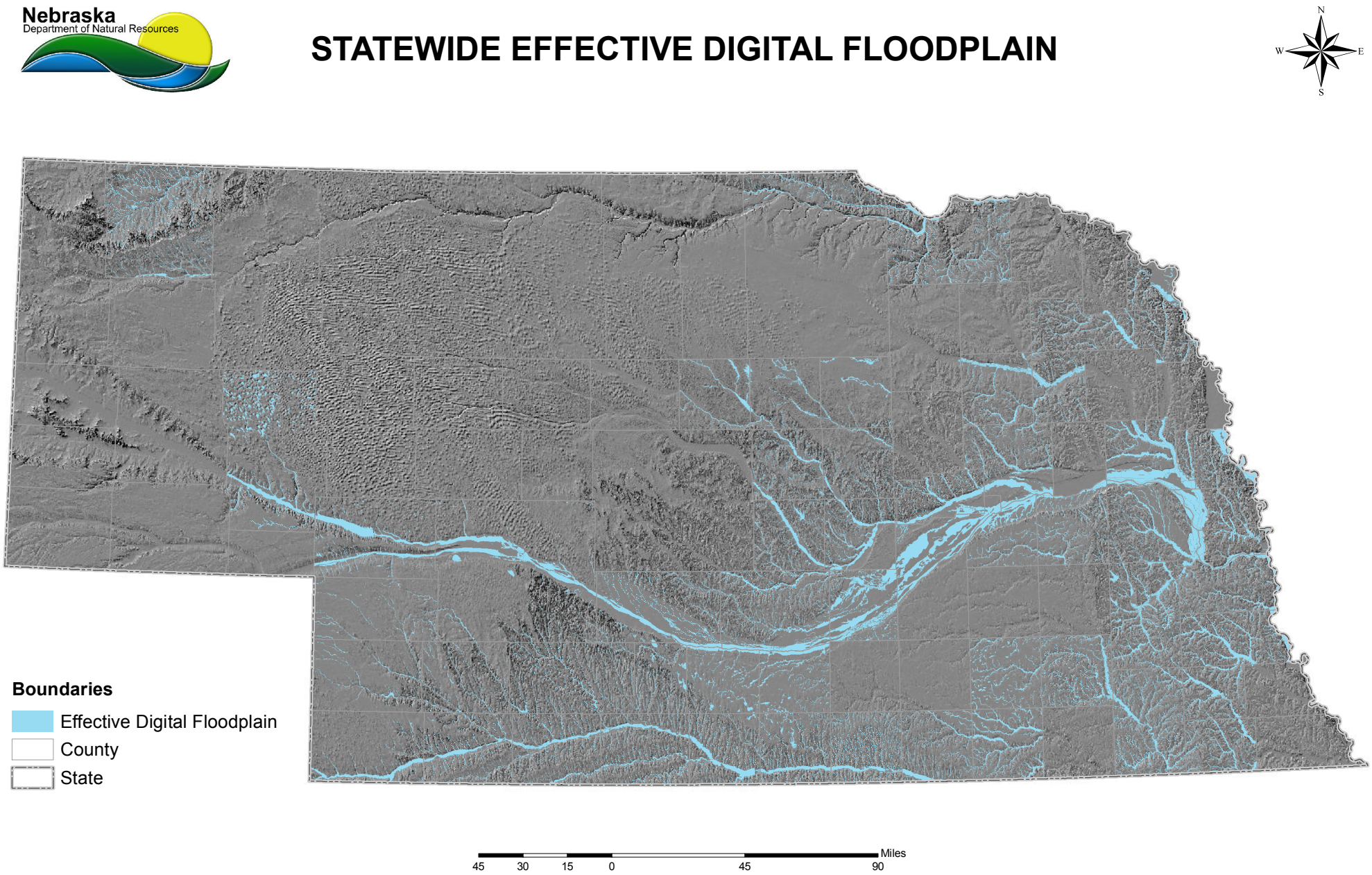


Figure III.2. Statewide Effective Digital Floodplain

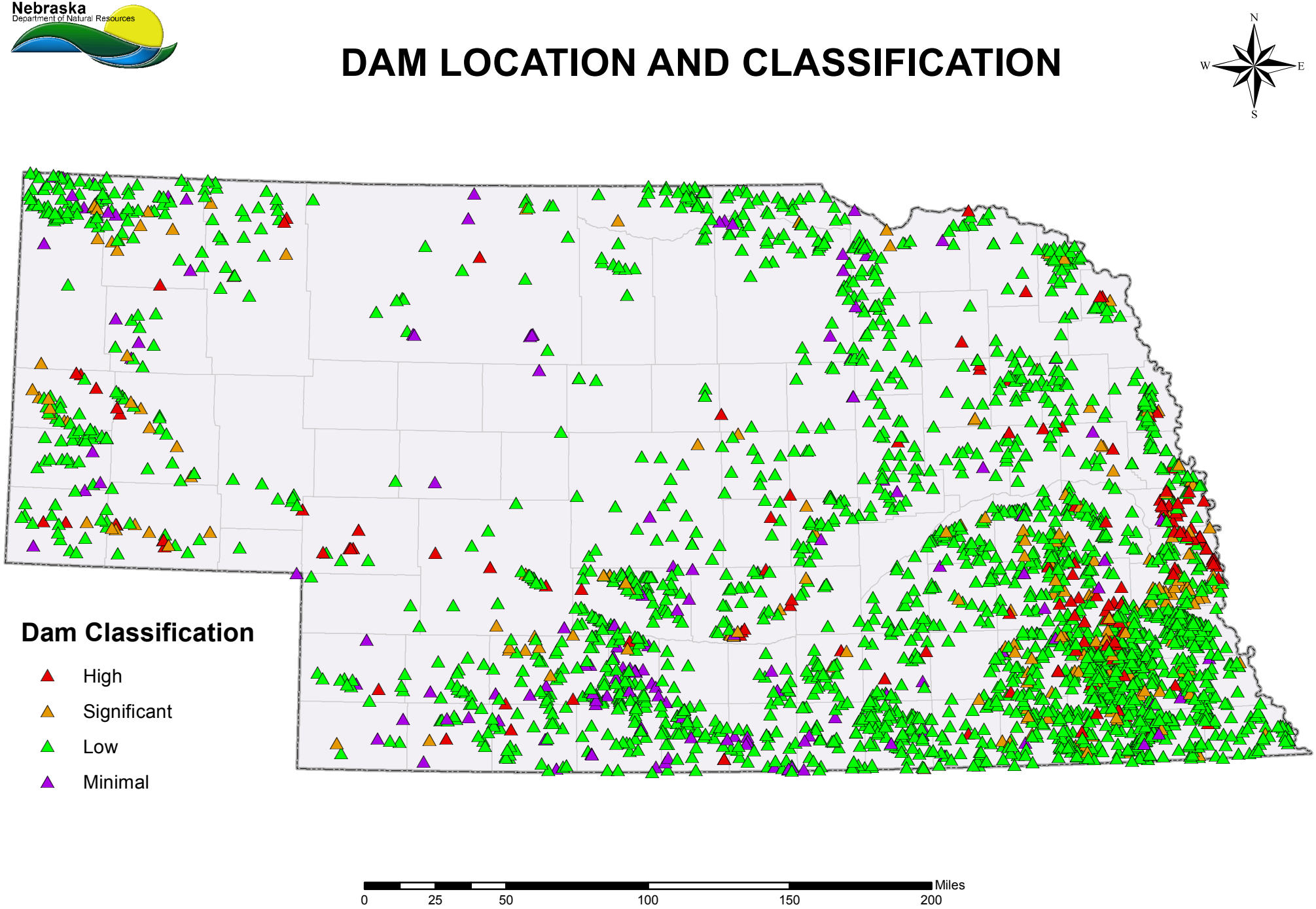


Figure III.3. Dam Location and Classification

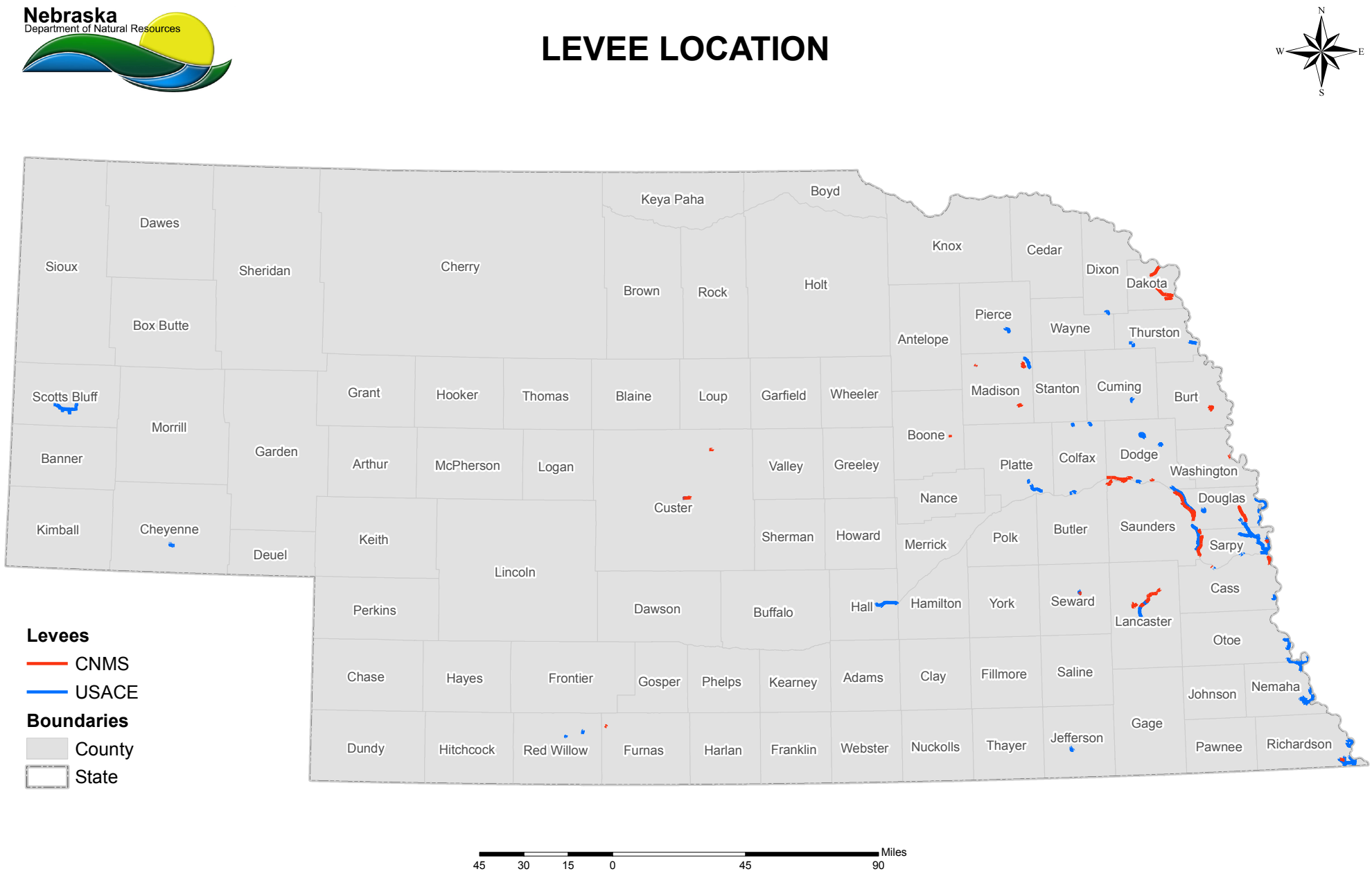


Figure III.4. Levee Location

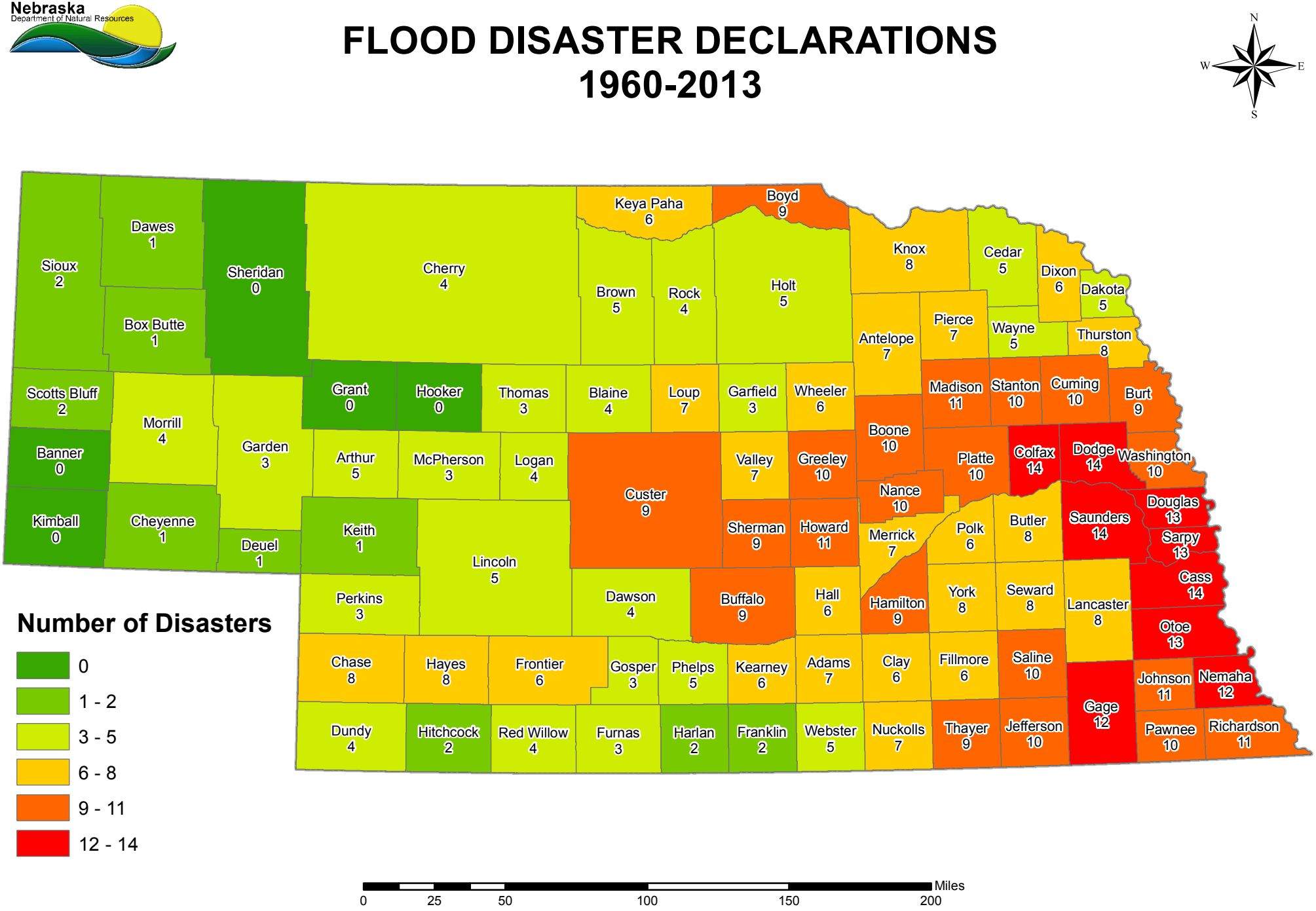


Figure III.5. Nebraska Flood Disaster Declarations

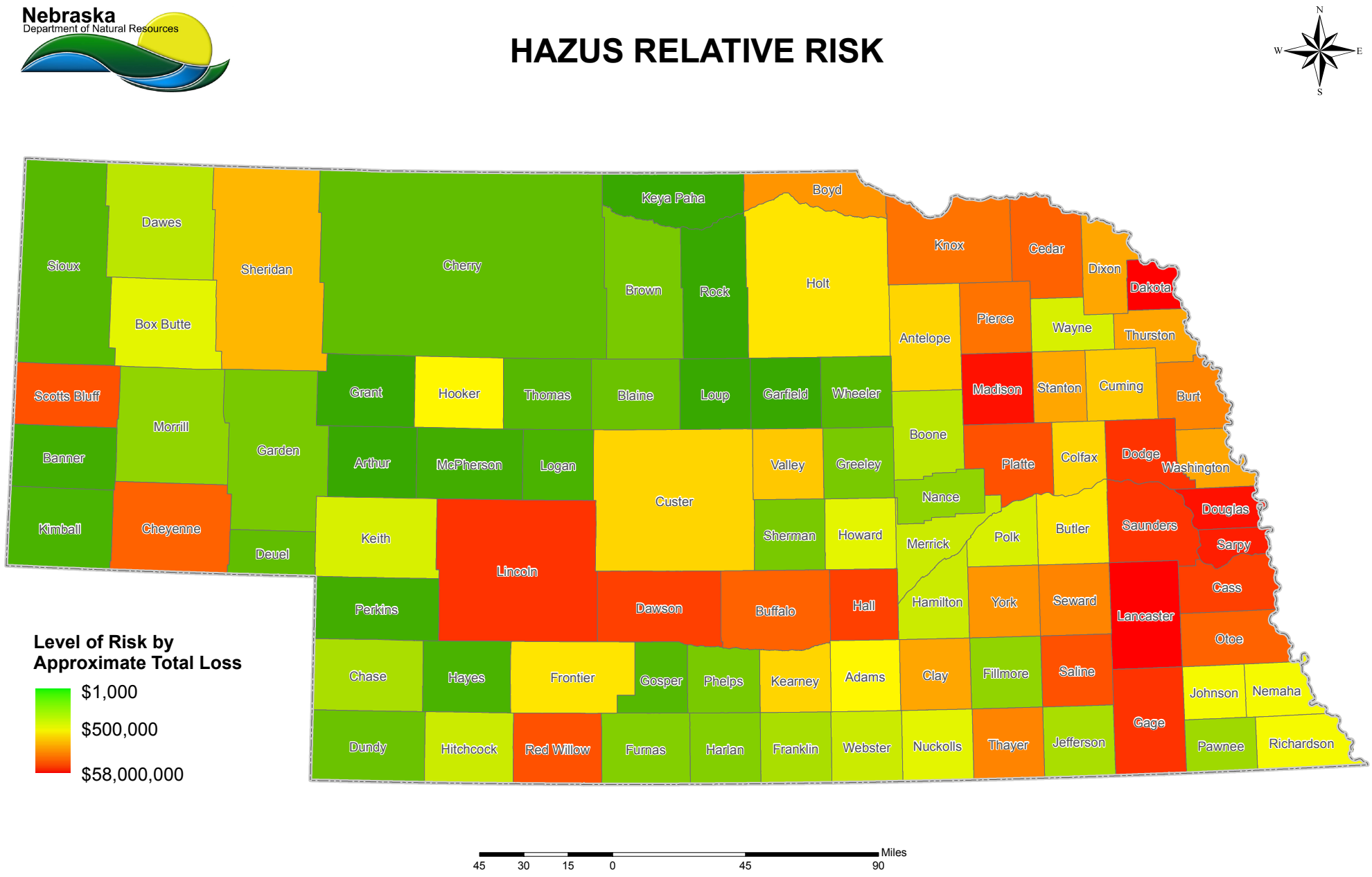


Figure III.6. HAZUS Relative Risk

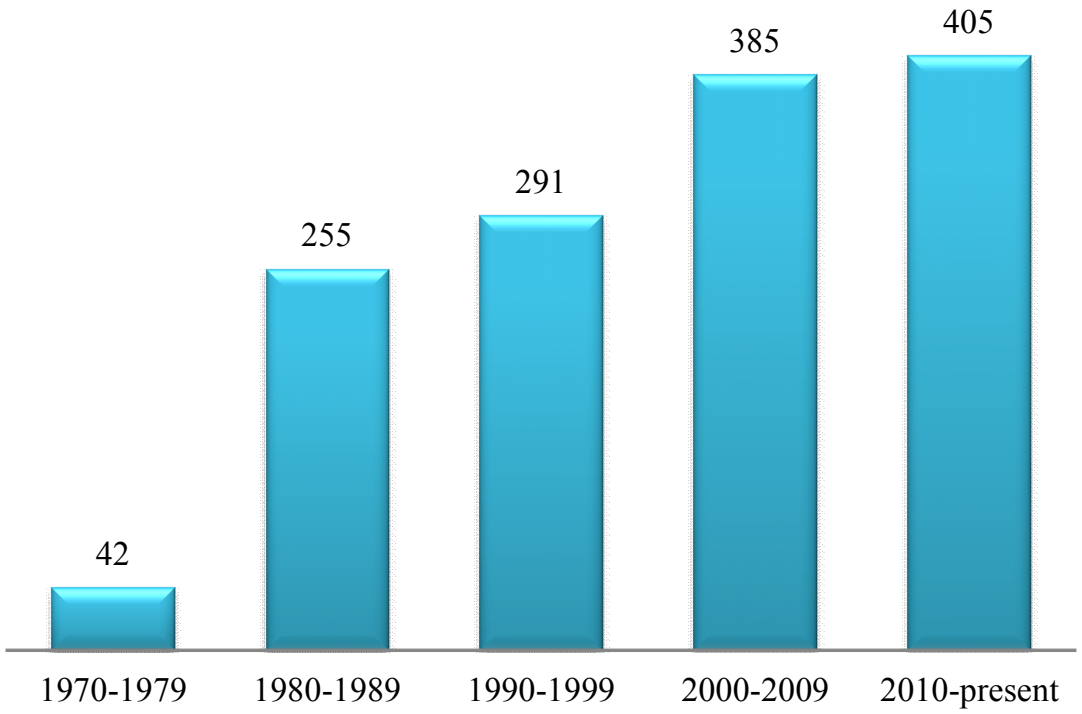


Figure IV.1. Growth of NFIP Communities in Nebraska

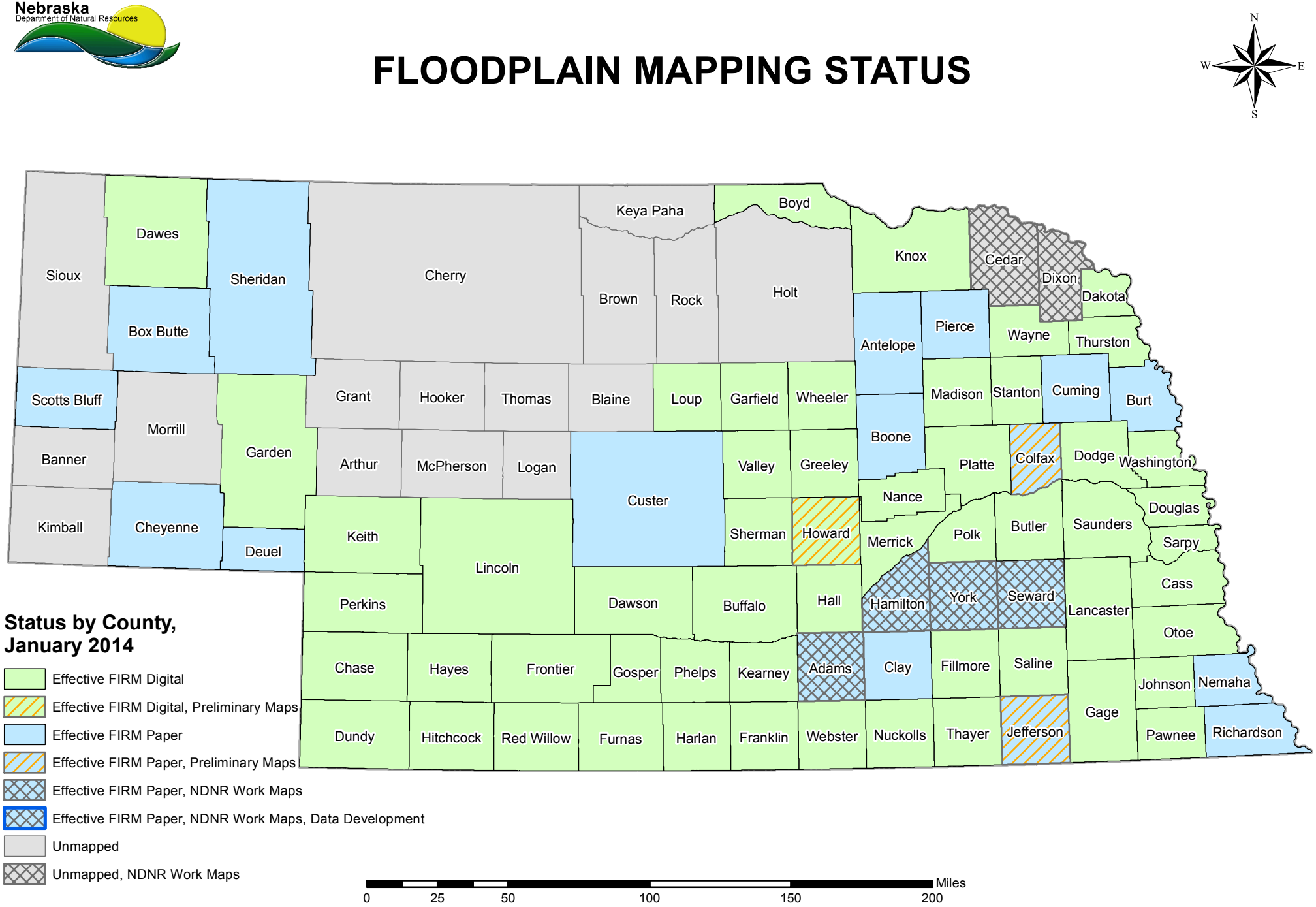


Figure IV.2. Floodplain Mapping Status in Nebraska

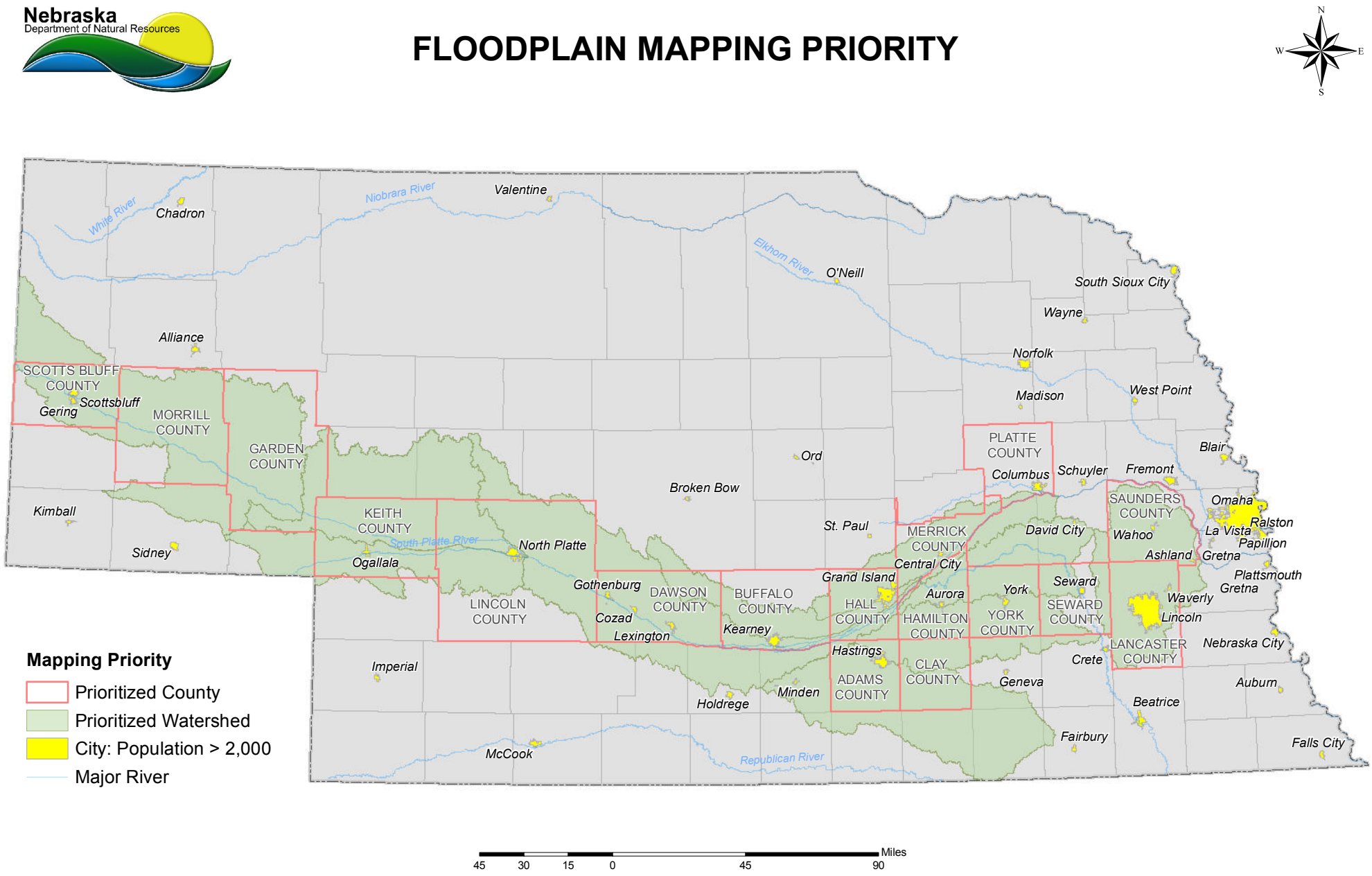


Figure IV.3. Mapping Priorities

APPENDIX B

Table 1 Floods of Record for Select River Gages in Nebraska

Subregion (4-Digit HUC)	Flood Source	Closest Community	Date	Record Discharge[1] (cfs)	Record Stage[1] (feet)	Comments
Missouri	Missouri River	South Sioux City	July 20, 2011	192,000	35.24	
		Decatur	June 28, 2011	191,000	40.03	
		Omaha	April 18, 1952	396,000	30.20	Peak stage reported as 40.20 by some data sources; the exact reason for the discrepancy is unknown.
			July 2, 2011	217,000	36.29	
		Nebraska City	June 28, 2011	229,000	28.27	
			April 19, 1952	414,000	26.57	
		Rulo	June 27, 2011	328,000	27.26	
			April 22, 1952	358,000	25.60	
Missouri-Nishnabotna	Big Nemaha River	Falls City	October 11, 1973	71,600	31.40	
Missouri-Nishnabotna	Little Nemaha	Auburn	May 9, 1950	164,000	27.65	
Elkhorn	Elkhorn River	Ewing	June 14, 2010	27,300	13.26	
		Norfolk	June 15, 2010	41,100	17.22	
		West Point	June 17, 2010	65,400	15.21	
			March 9, 1993		18.60	Stage from NOAA website
		Waterloo	June 12, 1944	100,000	16.60	
Elkhorn	North Fork Elkhorn	Pierce	February 19, 1971	15,200	15.10	
Platte	Platte River	Overton	June 5, 1935	37,600	6.25	
			May 25, 2008	11,200	9.05	
		Kearney	June 29, 1983	23,700	7.42	
			February 24, 1994		8.62	Stage from NOAA website
		Grand Island	June 6, 1935	30,000	5.99	
			June 27, 2011	10,400	6.32	
		Duncan	June 23, 1905	44,100	6.50	
			March 11, 1993	18,000	7.86	

Table 1 Floods of Record for Select River Gages in Nebraska

Subregion (4-Digit HUC)	Flood Source	Closest Community	Date	Record Discharge[1] (cfs)	Record Stage[1] (feet)	Comments
		North Bend	March 29, 1960	112,000	10.04	
			March 19, 1978	80,000	15.55	
		Ashland	March 10, 1993	130,000	19.23	
			February 20, 1997		23.05	Stage from NOAA website
		Louisville	July 25, 1993	160,000	11.90	
			March 30, 1960	124,000	12.45	
Platte	Salt Creek	Roca	May 8, 1950	67,000	26.00	
		Lincoln	July 24, 1993	28,400	26.52	
		Greenwood	June 13, 1984	46,800	26.50	
			July 24, 1993	42,000	26.57	
Platte	Wahoo Creek	Ithaca	June 24, 1963	77,400	22.93	
Kansas	West Fork Big	Dorchester	July 10, 1950	49,400	24.80	
Kansas	Big Blue River	Crete	July 10, 1950	27,600	28.74	
			July 3, 1986	24,300	29.86	
		Barneston	June 9, 1941	57,700	34.30	
Kansas	Little Blue River	DeWeese	August 31, 1969	25,100	18.57	
		Fairbury	July 25, 1992	54,000	24.33	
Niobrara	Niobrara River	Sparks	March 5, 1949	10,200	6.73	
			March 2, 1994	4,800	9.00	
		Spencer	March 12, 1955	27,400	12.16	
		Verdel	March 27, 1960	39,000	10.10	
			March 12, 1966	16,000	10.62	
Loup	Middle Loup	Dunning	March 25, 1996	2,480	6.15	
			March 31, 1949	660	7.02	
		St. Paul	June 23, 1947	72,000	12.69	
Loup	South Loup River	St. Michael	June 22, 1947	50,000	12.00	
Loup	North Loup River	Taylor	May 28, 1995	3,480	5.59	
		St. Paul	June 6, 1896	90,000	14.90	
Loup	Loup River	Genoa	August 16, 1966	129,000	13.93	
Republican	North Fork	CO/NE State line	April 28, 1947	2,110	5.92	
Republican	South Fork	Benkelman	August 16, 1958	150,000	10.10	
Republican	Republican River	Stratton	July 31, 1962	26,800	9.34	

Table 1 Floods of Record for Select River Gages in Nebraska

Subregion (4-Digit HUC)	Flood Source	Closest Community	Date	Record Discharge[1] (cfs)	Record Stage[1] (feet)	Comments
		McCook	March 21, 1960	5,890	9.14	
		Cambridge	June 22, 1947	160,000	16.70	
		Guide Rock	June 16, 1957	29,200	20.73	
		Hardy	June 2, 1935	225,000	19.40	
Republican	Frenchman Creek	Palisade	June 17, 1956	5,560	8.79	
		Culbertson	May 31, 1935	15,000	14.80	
North Platte	North Platte River	WY/NE State line	June 2, 1929	17,900	7.04	
		North Platte	June 11, 1909	29,600	5.00	
			June 3, 2011		7.69	Stage from NOAA website
South Platte	South Platte River	Roscoe	June 6, 1995	20,100	11.29	
			September 20, 2013	18,500	12.20	

[1]For some sites, peak discharge and peak stage are not from the same flood events. This could be due to a variety of factors such as changes to streamgaging infrastructure, better measurement equipment, different measurement points or methods for each parameter, or channel or floodplain modifications that have impacted the flooding characteristics. Generally, the specific cause of the differences is unknown.

Table 2 Levee Overview

Levee System or Project Name/ (FEMA - R7 Levee ID #)	County/(City)	River or Stream	Approximate Level of Protection	Urban or Agricultural
Lake Waconda (1310)	Cass (N/A)	Missouri	100 – 500 Year Flood	Urban
Omaha Fish/Wildlife (1311)	Cass (N/A)	Platte	0 – 24 Years	Urban
YMCA Camp Kitaki (1312)	Cass (N/A)	Platte	100 – 500 Year Flood	Urban
Sidney	Cheyenne (Sidney)	Lodgepole Creek	100 – 500 Year Flood	Urban
Clarkson FFP (1313)	Colfax (Clarkson)	Maple Creek	50 – 99 Year Flood	Urban
Howells FFP (1314)	Colfax (Howells)	Maple Creek	100 – 500 Year Flood	Urban
Schuyler FCP (1315)	Colfax (Schuyler)	Platte	50 – 99 Year Flood	Urban
West Point FCP (1316)	Cuming (West Point)	Elkhorn	50 – 99 Year Flood	Urban
Broken Bow FPP (1317)	Custer (Broken Bow)	Mud Creek	50 – 99 Year Flood	Urban
Wakefield (1318)	Dixon (Wakefield)	Logan	100 – 500 Year Flood	Urban
Ames (1319)	Dodge (Ames)	Platte	50 – 99 Year Flood	Urban
Hooper FCP (1320)	Dodge (Hooper)	Elkhorn	100 – 500 Year Flood	Urban
Scribner FPP (1321)	Dodge (Scribner)	Elkhorn	100 – 500 Year Flood	Urban
No-Name Dike (1322)	Douglas (Valley)	Platte	50 – 99 Year Flood	Agricultural
Omaha Channel Improvements (1323)	Douglas (Omaha)	Little Papio Crk	0 – 24 Years	Urban
Omaha FPP (1324)	Douglas (Omaha)	Missouri	100 – 500 Year Flood	Urban
Union Dike (1325)	Douglas (Valley)	Platte	100 – 500 Year Flood	Urban
Waterloo (1326)	Douglas (Waterloo)	Elkhorn	100 – 500 Year Flood	Agricultural
Wood River FPP (1327)	Hall (Grand Island)	Wood River	100 – 500 Year Flood	Urban
Fairbury (1328)	Jefferson (Fairbury)	Little Blue	100 – 500 Year Flood	Urban
Salt Creek FPP (1329)	Lancaster (Lincoln)	Salt Creek	50 – 99 Year Flood	Urban
Madison FCP(1330)	Madison (Madison)	Union Creek	50 – 99 Year Flood	Urban
Meadow Grove FCP (1331)	Madison (Meadow Grove)	Buffalo Creek	50 – 99 Year Flood	Urban
Norfolk FPP (1332)	Madison (Norfolk)	Elkhorn	100 – 500 Year Flood	Urban
MRLU R-548	Nemaha (Brownville/Nemaha)	Missouri	50 – 99 Year Flood	Agricultural
MRLU R-562 (1335)	Nemaha (Peru)	Missouri	50 – 99 Year Flood	Agricultural
MRLU R-573	Otoe (Nebraska City)	Missouri	50 – 99 Year Flood	Agricultural
Pierce FCP (1338)	Pierce (Pierce)	Elkhorn	50 – 99 Year Flood	Agricultural
Columbus Lost Creek (1339)	Platte (Columbus)	Lost Creek	100 – 500 Year Flood	Urban
Columbus Loup River (1340)	Platte (Columbus)	Loup River	100 – 500 Year Flood	Urban

Table 2 Levee Overview

Levee System or Project Name/ (FEMA - R7 Levee ID #)	County/(City)	River or Stream	Approximate Level of Protection	Urban or Agricultural
Bartley (1341)	Red Willow (Bartley)	Dry Creek	100 – 500 Year Flood	Agricultural
Indianola (1342)	Red Willow (Indianola)	Coon Creek	100 – 500 Year Flood	Urban
MRLU R-520 (1343)	Richardson (Rulo)	Missouri	50 – 99 Year Flood	Agriculture
MRLU R-613 (1344)	Sarpy (Bellevue)	Missouri	100 – 500 Year Flood	Agriculture
MRLU R-616 (1345)	Sarpy (Bellevue)	Missouri	100 – 500 Year Flood	Agriculture
Clear Creek (1346)	Saunders (Ashland)	Platte	50 – 99 Year Flood	Urban
Gering FPP (1347)	Scotts Bluff (Gering)	Platte	50 – 99 Year Flood	Urban
Seward FPP (1348)	Seward (Seward)	Big Blue	100 – 500 Year Flood	Urban
Macy FCP (1349)	Thurston (Macy)	Blackbird	50 – 99 Year Flood	Agricultural
Pender (1350)	Thurston (Pender)	Logan Creek	100 – 500 Year Flood	Urban
Other Levees				
Vorhees Creek Levee	Boone (N/A)	Vorhees Creek	<100 Year Flood	Agricultural
Tekamah Diversion Ditch Levee	Burt (Tekamah)	Tekamah Div. Ditch	100 – 500 Year Flood	Urban
Mud Creek Levee	Burt (Tekamah)	Mud Creek	100 – 500 Year Flood	Urban
Loup River	Custer (N/A)	Loup River	<100 Year Flood	Agricultural
Pigeon Creek Ditch Levee	Dakota (N/A)	Pigeon Creek Ditch	<100 Year Flood	Agricultural
Omaha Creek Ditch Levee	Dakota (N/A)	Omaha Creek Ditch	<100 Year Flood	Agricultural
Elk Creek Levee	Dakota (Jackson)	Elk Creek	100 – 500 Year Flood	Urban
Big Papillion Creek Levee	Douglas (Omaha)	Big Papillion Creek	<100 Year Flood	Urban
Medicine Creek Levee	Furnas (Cambridge)	Medicine Creek	<100 Year Flood	Urban
Big Blue River Levee	Gage (Beatrice)	Big Blue River	<100 Year Flood	Urban
Indian Creek Levee	Gage (Beatrice)	Indian Creek	<100 Year Flood	Urban
Oak Creek Levee	Lancaster (Lincoln)	Oak Creek	<100 Year Flood	Urban
MRLU L-575	Nemaha (N/A)	Missouri	<100 Year Flood	Agricultural
White Tail Lake	Platte (N/A)	Loup River	100 – 500 Year Flood	Urban
MRLU R-512-513	Richardson (N/A)	Big Nemaha River	<100 Year Flood	Agricultural
Platte Valley Drainage District	Saunders (N/A)	Platte	<100 Year Flood	Agricultural
Morse Bluff Drainage District	Saunders (N/A)	Platte	<100 Year Flood	Agricultural
Woodcliff	Saunders (N/A)	Platte	<100 Year Flood	Agricultural
Western Sarpy Drainage District Levee	Sarpy (N/A)	Platte	<100 Year Flood	Agricultural

Table 3 Vulnerabilities Identified in Local Hazard Mitigation Plans

Plan ID	Plan Date	Counties Included	Level of Flood Risk Identified in Local Plan	Population Affected	# of Structures Affected	# of Critical Facilities Affected	Potential Loss	Comments
Cedar/Dixon Counties	April, 2010	Cedar County	Probability: Likely, Extent: Severe	N/A	278	N/A	$31,804,000	Level of Risk represents the entire planning area
	April, 2010	Dixon County	Probability: Likely, Extent: Severe	N/A	48	N/A	$23,423,000	Level of Risk represents the entire planning area
Papio-Missouri River NRD	January, 2011	Burt County	Vulnerability Rating: Low	690	29	5	$26,819,000	Level of Risk represents the entire planning area
	January, 2011	Dakota County	Vulnerability Rating: Low	1078	16	6	$19,662,000	Level of Risk represents the entire planning area
	January, 2011	Douglas County	Vulnerability Rating: Low	13172	811	23	$574,528,000	Level of Risk represents the entire planning area
	January, 2011	Sarpy County	Vulnerability Rating: Low	4288	498	13	$210,913,000	Level of Risk represents the entire planning area
	January, 2011	Thurston County	Vulnerability Rating: Low	164	0	7	$9,499,000	Level of Risk represents the entire planning area
	January, 2011	Washington County	Vulnerability Rating: Low	1582	15	20	$29,248,000	Level of Risk represents the entire planning area
Tri-County	July, 2010	Antelope County	Probability: Possible, Extent: Limited	N/A	44	N/A	$25,950,000	Level of Risk represents the entire planning area
	July, 2010	Holt County	Probability: Possible, Extent: Limited	N/A	2	N/A	$9,582,000	Level of Risk represents the entire planning area
	July, 2010	Knox County	Probability: Possible, Extent: Limited	N/A	151	N/A	$56,106,000	Level of Risk represents the entire planning area
Lower Elkhorn NRD	June, 2009	Pierce County	Probability: Possible, Extent: Limited	N/A	172	N/A	$59,641,000	Level of Risk represents the entire planning area
	June, 2009	Wayne County	Probability: Possible, Extent: Limited	N/A	2	N/A	$7,598,000	Level of Risk represents the entire planning area
	June, 2009	Stanton County	Probability: Possible, Extent: Limited	N/A	44	N/A	$16,084,000	Level of Risk represents the entire planning area
	June, 2009	Cuming County	Probability: Possible, Extent: Limited	N/A	144	N/A	$34,712,000	Level of Risk represents the entire planning area
	June, 2009	Madison County	Probability: Possible, Extent: Limited	N/A	1379	N/A	$328,262,000	Level of Risk represents the entire planning area
	June, 2009	Colfax County	Probability: Possible, Extent: Limited	N/A	47	N/A	$31,024,000	Level of Risk represents the entire planning area
	June, 2009	Burt County	Probability: Possible, Extent: Limited	N/A	177	N/A	$59,201,000	Level of Risk represents the entire planning area
Lower Platte North NRD	March, 2010	Butler County	Probability: Likely, Extent: Severe	N/A	25	N/A	$931,600	Level of Risk represents the entire planning area
	March, 2010	Dodge County	Probability: Likely, Extent: Severe	N/A	47	N/A	$31,024,000	Level of Risk represents the entire planning area
	March, 2010	Saunders County	Probability: Likely, Extent: Severe	N/A	201	N/A	$57,388,000	Level of Risk represents the entire planning area
Lower Platte South NRD	November, 2008	Lancaster County	Probability: Possible, Extent: Limited	N/A	6188	N/A	$2,212,062,659	Level of Risk represents the entire planning area

Table 3 Vulnerabilities Identified in Local Hazard Mitigation Plans

Plan ID	Plan Date	Counties Included	Level of Flood Risk Identified in Local Plan	Population Affected	# of Structures Affected	# of Critical Facilities Affected	Potential Loss	Comments
	November, 2008	Cass County	Probability: Possible, Extent: Limited	N/A	1190	N/A	$31,692,479	Level of Risk represents the entire planning area
Nemaha NRD	February, 2010	Otoe County	Probability: Likely, Extent: Severe	N/A	38	N/A	$21,826,000	Level of Risk represents the entire planning area
	February, 2010	Richardson County	Probability: Likely, Extent: Severe	N/A	8	N/A	$6,796,000	Level of Risk represents the entire planning area
	February, 2010	Nemaha County	Probability: Likely, Extent: Severe	N/A	2	N/A	$6,685,000	Level of Risk represents the entire planning area
	February, 2010	Johnson County	Probability: Likely, Extent: Severe	N/A	2	N/A	$6,647,000	Level of Risk represents the entire planning area
	February, 2010	Pawnee County	Probability: Likely, Extent: Severe	N/A	5	N/A	$3,388,000	Level of Risk represents the entire planning area
Region 24	August, 2012	Boyd County	Probability: Possible, Extent: Limited	N/A	28	N/A	$17,139,000	Level of Risk represents the entire planning area
	August, 2012	Brown County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$1,567,000	Level of Risk represents the entire planning area
	August, 2012	Cherry County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$2,288,000	Level of Risk represents the entire planning area
	August, 2012	Keya Paha County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$566,000	Level of Risk represents the entire planning area
	August, 2012	Rock County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$297,000	Level of Risk represents the entire planning area
Lower Loup NRD	May, 2012	Boone County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Custer County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Garfield County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Greeley County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Howard County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Loup County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Nance County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Platte County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Sherman County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Valley County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area
	May, 2012	Wheeler County	High	N/A	N/A	N/A	$241,869	Values represent entire planning area

Table 3 Vulnerabilities Identified in Local Hazard Mitigation Plans

Plan ID	Plan Date	Counties Included	Level of Flood Risk Identified in Local Plan	Population Affected	# of Structures Affected	# of Critical Facilities Affected	Potential Loss	Comments
Central Platte NRD	December, 2011	Buffalo County	Medium	N/A	N/A	N/A	$675,757	Values represent entire planning area
	December, 2011	Dawson County	Medium	N/A	N/A	N/A	$675,757	Values represent entire planning area
	December, 2011	Merrick County	Medium	N/A	N/A	N/A	$675,757	Values represent entire planning area
	December, 2011	Polk County	Medium	N/A	N/A	N/A	$675,757	Values represent entire planning area
Hall County	September, 2008	Hall County	Probability: High, Extent: Severe	N/A	N/A	3	$25,220,041	N/A
Hamilton County	August, 2009	Hamilton County	Probability: Likely, Extent: Limited	N/A	5	N/A	$9,520,000	N/A
York County	November, 2009	York County	Probability: Likely, Extent: Limited	N/A	13	N/A	$16,037,000	N/A
Seward County	December, 2008	Seward County	Probability: Highly Likely, Extent: Limited	N/A	55	N/A	$1,133,012	N/A
Lower Big Blue and Little Blue NRDs	December, 2010	Adams County	Medium	N/A	N/A	N/A	$14,700,000	N/A
	December, 2010	Clay County	Medium	N/A	N/A	N/A	$2,600,000	N/A
	December, 2010	Fillmore County	Medium	N/A	N/A	N/A	$2,400,000	N/A
	December, 2010	Gage County	Medium	N/A	N/A	N/A	$8,600,000	N/A
	December, 2010	Jefferson County	High	N/A	N/A	N/A	$2,100,000	N/A
	December, 2010	Nuckolls County	Medium	N/A	N/A	N/A	$3,300,000	N/A
	December, 2010	Saline County	High	N/A	N/A	N/A	$5,900,000	N/A
	December, 2010	Thayer County	Medium	N/A	N/A	N/A	$3,100,000	N/A
	December, 2010	Webster County	Medium	N/A	N/A	N/A	$2,800,000	N/A
Upper Loup NRD	August, 2009	Hooker County	Probability: Possible, Extent: Limited	N/A	7	N/A	$6,328,000	Level of Risk represents the entire planning area
	August, 2009	Thomas County	Probability: Possible, Extent: Limited	N/A	2	N/A	$845,000	Level of Risk represents the entire planning area
	August, 2009	Blaine County	Probability: Possible, Extent: Limited	N/A	3	N/A	$2,732,000	Level of Risk represents the entire planning area
	August, 2009	Logan County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$454,000	Level of Risk represents the entire planning area

Table 3 Vulnerabilities Identified in Local Hazard Mitigation Plans

Plan ID	Plan Date	Counties Included	Level of Flood Risk Identified in Local Plan	Population Affected	# of Structures Affected	# of Critical Facilities Affected	Potential Loss	Comments
Twin-Platte NRD	August, 2011	Lincoln County	High	N/A	N/A	23	$15,679,539	N/A
	August, 2011	McPherson County	Medium	N/A	N/A	0	N/A	Insufficient data in McPherson County
	August, 2011	Arthur County	Medium	N/A	N/A	3	$302,297	N/A
	August, 2011	Keith County	Medium	N/A	N/A	10	$3,333,704	N/A
Perkins County	July, 2009	Perkins County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$458,000	N/A
Chase County	January, 2010	Chase County	Probability: Highly Likely, Extent: Severe	N/A	40	N/A	$8,600,000	N/A
Dundy County	July, 2010	Dundy County	Probability: Likely, Extent: Limited	N/A	N/A	N/A	$1,530,000	N/A
Frontier County	October, 2008	Frontier County	Probability: Medium, Extent: Limited	N/A	N/A	N/A	$159,000	N/A
Hayes County	September, 2009	Hayes County	Probability: Highly Likely, Extent: Limited	N/A	N/A	N/A	$325,667	N/A
Hitchcock County	August, 2010	Hitchcock County	Probability: Medium, Extent: Limited	N/A	12	N/A	$298,937	N/A
Tr-Basin NRD	December, 2011	Gosper County	Medium	N/A	N/A	N/A	$3,540,000	Level of Risk represents the entire planning area
	December, 2011	Kearney County	Medium	N/A	N/A	N/A	$8,380,000	Level of Risk represents the entire planning area
	December, 2011	Phelps County	Medium	N/A	N/A	N/A	$10,300,000	Level of Risk represents the entire planning area
Quad County	December, 2009	Franklin County	Probability: Likely, Extent: Limited	N/A	21	N/A	$4,579,000	Level of Risk represents the entire planning area
	December, 2009	Furnas County	Probability: Likely, Extent: Limited	N/A	12	N/A	$7,976,000	Level of Risk represents the entire planning area
	December, 2009	Harlan County	Probability: Likely, Extent: Limited	N/A	2	N/A	$4,647,000	Level of Risk represents the entire planning area
	December, 2009	Red Willow County	Probability: Likely, Extent: Limited	N/A	24	N/A	$16,417,000	Level of Risk represents the entire planning area
Region 23	January, 2010	Box Butte County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$2,500,000	Level of Risk represents the entire planning area
	January, 2010	Dawes County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$4,436,000	Level of Risk represents the entire planning area
	January, 2010	Sheridan County	Probability: Possible, Extent: Limited	N/A	11	N/A	$12,751,000	Level of Risk represents the entire planning area
	January, 2010	Sioux County	Probability: Possible, Extent: Limited	N/A	N/A	N/A	$490,000	Level of Risk represents the entire planning area
North Platte NRD	March, 2011	Banner County	Probability: Likely, Extent: Critical	N/A	0	N/A	$877,000	Level of Risk represents the entire planning area

Table 3 Vulnerabilities Identified in Local Hazard Mitigation Plans

Plan ID	Plan Date	Counties Included	Level of Flood Risk Identified in Local Plan	Population Affected	# of Structures Affected	# of Critical Facilities Affected	Potential Loss	Comments
	March, 2011	Garden County	Probability: Likely, Extent: Critical	N/A	4	N/A	$2,028,000	Level of Risk represents the entire planning area
	March, 2011	Morrill County	Probability: Likely, Extent: Critical	N/A	0	N/A	$2,638,000	Level of Risk represents the entire planning area
	March, 2011	Scotts Bluff County	Probability: Likely, Extent: Critical	N/A	17	N/A	$25,759,000	Level of Risk represents the entire planning area
Not Identified in a Plan	N/A	Cheyenne County	N/A	N/A	N/A	N/A	$1,632,000	Medium relative risk per statewide HAZUS assessment; dollar values are for qualitative demonstration of relative risk only.
	N/A	Deuel County	N/A	N/A	N/A	N/A	$39,000	Low relative risk per statewide HAZUS assessment; dollar values are for qualitative demonstration of relative risk only.
	N/A	Grant County	N/A	N/A	N/A	N/A	$0	Low relative risk per statewide HAZUS assessment; dollar values are for qualitative demonstration of relative risk only.
	N/A	Kimball County	N/A	N/A	N/A	N/A	$10,000	Low relative risk per statewide HAZUS assessment; dollar values are for qualitative demonstration of relative risk only.

Table 4 FEMA NFIP Policy and Claims Report

County	Number Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Paid Since 1978
Adams County	36	$6,414,200	$23,889	17	$47,596
Antelope County	14	$1,790,700	$6,773	9	$288,677
Blaine County	2	$153,500	$1,609	0	$0
Boone County	25	$2,382,100	$19,458	8	$31,509
Box Butte County	11	$1,684,600	$6,904	0	$0
Boyd County	18	$932,900	$9,121	14	$83,315
Buffalo County	259	$50,465,100	$183,770	16	$44,862
Burt County	45	$7,129,700	$28,679	37	$717,773
Butler County	68	$5,141,200	$38,059	4	$4,434
Cass County	704	$134,275,700	$469,096	392	$3,159,075
Cedar County	58	$4,256,600	$43,062	0	$0
Chase County	5	$509,000	$2,861	1	$3,028
Cheyenne County	32	$4,442,200	$34,103	17	$57,897
Clay County	18	$6,863,300	$49,412	0	$0
Colfax County	202	$16,501,100	$131,509	144	$1,257,967
Cuming County	98	$9,991,600	$84,704	13	$35,468
Custer County	95	$7,237,000	$63,716	4	$69,883
Dakota County	179	$41,587,300	$173,484	73	$465,953
Dawes County	19	$1,385,600	$10,838	0	$0
Dawson County	315	$49,883,400	$152,823	48	$207,902
Deuel County	17	$1,347,700	$11,393	13	$26,520
Dixon County	10	$1,020,700	$3,251	2	$2,820
Dodge County	1702	$213,539,500	$1,168,974	499	$2,603,567
Douglas County	1898	$384,791,900	$1,704,373	630	$4,010,140
Dundy County	1	$29,300	$333	0	$0
Fillmore County	3	$241,200	$2,321	2	$25,000
Franklin County	5	$569,400	$2,458	0	$0
Frontier County	1	$28,000	$154	0	$0
Furnas County	5	$245,300	$2,399	1	$0
Gage County	129	$12,426,400	$81,561	154	$1,196,485
Garden County	19	$1,524,500	$9,624	2	$4,926

Table 4 FEMA NFIP Policy and Claims Report

County	Number Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Paid Since 1978
Garfield County	4	$387,400	$2,273	0	$0
Gosper County	5	$427,000	$4,876	0	$0
Greeley County	1	$280,000	$378	0	$0
Hall County	317	$42,071,300	$280,048	112	$405,254
Hamilton County	23	$4,051,200	$15,771	15	$86,197
Harlan County	7	$728,900	$4,220	0	$0
Hayes County	2	$6,300	$152	0	$0
Hitchcock County	16	$6,502,800	$42,678	1	$759
Holt County	17	$1,852,700	$10,275	2	$0
Hooker County	1	$45,000	$402	0	$0
Howard County	76	$8,326,500	$56,132	4	$2,016
Jefferson County	6	$873,300	$5,841	7	$13,120
Johnson County	38	$7,248,300	$39,260	2	$1,972
Kearney County	52	$5,023,700	$37,375	2	$6,349
Keith County	72	$13,988,700	$103,525	5	$19,968
Knox County	53	$4,238,500	$36,495	15	$469,995
Lancaster County	2,193	$404,961,400	$1,899,556	114	$306,022
Lincoln County	600	$90,655,200	$385,724	73	$218,293
Loup County	1	$20,000	$128	0	$0
Madison County	192	$27,347,600	$158,347	61	$3,099,103
Merrick County	405	$49,100,300	$311,697	103	$296,482
Morrill County	18	$5,645,000	$11,359	1	$7,024
Nance County	24	$1,927,700	$15,908	1	$0
Nemaha County	15	$2,669,000	$23,648	53	$521,998
Nuckolls County	8	$425,800	$3,281	3	$7,069
Otoe County	47	$12,301,100	$68,880	19	$456,850
Pawnee County	6	$358,400	$4,989	1	$0
Perkins County	3	$462,000	$736	0	$0
Phelps County	23	$3,425,800	$18,355	8	$74,756
Pierce County	47	$4,132,500	$28,920	5	$16,106
Platte County	276	$52,900,200	$150,259	74	$440,877

Table 4 FEMA NFIP Policy and Claims Report

County	Number Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Paid Since 1978
Polk County	76	$5,076,600	$44,227	1	$150
Red Willow County	21	$2,217,000	$10,646	10	$35,534
Richardson County	13	$1,492,100	$13,407	87	$2,312,398
Rock County	1	$105,000	$277	0	$0
Saline County	362	$27,561,000	$243,033	116	$400,747
Sarpy County	1,018	$223,850,100	$744,121	992	$8,937,901
Saunders County	519	$102,202,600	$289,481	257	$2,145,477
Scotts Bluff County	239	$35,435,000	$209,243	49	$171,847
Seward County	32	$3,638,100	$24,715	21	$116,616
Sheridan County	6	$572,000	$2,625	0	$0
Sherman County	4	$197,500	$1,445	1	$7,046
Stanton County	157	$24,601,400	$137,761	13	$2,950,402
Thayer County	58	$3,500,400	$32,319	17	$174,713
Thurston County	9	$593,400	$3,112	16	$32,901
Valley County	6	$169,500	$3,587	5	$28,547
Washington County	133	$21,980,800	$118,239	134	$2,403,017
Wayne County	4	$1,126,100	$2,626	4	$1,495
Webster County	13	$845,800	$6,337	1	$1,727
Wheeler County	5	$402,900	$2,693	2	$7,763
York County	78	$7,080,300	$45,747	7	$0
State Total	**13,295**	**$2,183,821,900**	**$10,177,840**	**4,514**	**$40,523,288**

Table 5 Comparison of 2010 and 2012 NFIP Claims Data

County	Total Claims 1978-11/08/10	Total Paid 1978-11/08/10	Total Claims 1978-11/20/12	Total Paid 1978 - 11/20/12	Difference in Claims	Difference in Total Paid
Adams County	16	$47,596	17	$47,596	1	$0
Antelope County	9	$288,677	9	$288,677	0	$0
Blaine County	0	$0	0	$0	0	$0
Boone County	8	$26,309	8	$31,509	0	$5,200
Box Butte County	0	$0	0	$0	0	$0
Boyd County	6	$50,989	14	$83,315	8	$32,326
Buffalo County	16	$44,862	16	$44,862	0	$0
Burt County	5	$3,128	37	$717,773	32	$714,645
Butler County	4	$1,439	4	$4,434	0	$2,995
Cass County	265	$2,049,365	392	$3,159,075	127	$1,109,710
Cedar County	0	$0	0	$0	0	$0
Chase County	1	$3,028	1	$3,028	0	$0
Cheyenne County	14	$32,064	17	$57,897	3	$25,833
Clay County	0	$0	0	$0	0	$0
Colfax County	144	$1,245,043	144	$1,257,967	0	$12,924
Cuming County	13	$24,691	13	$35,468	0	$10,777
Custer County	4	$18,206	4	$69,883	0	$51,677
Dakota County	9	$11,405	73	$465,953	64	$454,548
Dawes County	0	$0	0	$0	0	$0
Dawson County	48	$205,173	48	$207,902	0	$2,729
Deuel County	13	$16,485	13	$26,520	0	$10,035
Dixon County	2	$2,820	2	$2,820	0	$0
Dodge County	497	$2,585,288	499	$2,603,567	2	$18,279
Douglas County	599	$3,182,041	630	$4,010,140	31	$828,099
Dundy County	0	$0	0	$0	0	$0
Fillmore County	2	$25,000	2	$25,000	0	$0
Franklin County	0	$0	0	$0	0	$0
Frontier County	0	$0	0	$0	0	$0
Furnas County	1	$0	1	$0	0	$0
Gage County	153	$1,196,485	154	$1,196,485	1	$0
Garden County	0	$0	2	$4,926	2	$4,926

Table 5 Comparison of 2010 and 2012 NFIP Claims Data

County	Total Claims 1978-11/08/10	Total Paid 1978-11/08/10	Total Claims 1978-11/20/12	Total Paid 1978 - 11/20/12	Difference in Claims	Difference in Total Paid
Gosper County	0	$0	0	$0	0	$0
Greeley County	0	$0	0	$0	0	$0
Hall County	112	$405,254	112	$405,254	0	$0
Hamilton County	15	$86,197	15	$86,197	0	$0
Harlan County	0	$0	0	$0	0	$0
Hitchcock County	1	$759	1	$759	0	$0
Holt County	2	$0	2	$0	0	$0
Hooker County	0	$0	0	$0	0	$0
Howard County	4	$2,016	4	$2,016	0	$0
Jefferson County	7	$13,120	7	$13,120	0	$0
Johnson County	2	$1,972	2	$1,972	0	$0
Kearney County	2	$6,349	2	$6,349	0	$0
Keith County	5	$19,968	5	$19,968	0	$0
Knox County	3	$0	15	$469,995	12	$469,995
Lancaster County	111	$292,487	114	$306,022	3	$13,535
Lincoln County	56	$90,336	73	$218,293	17	$127,957
Madison County	61	$1,742,532	61	$3,099,103	0	$1,356,571
Merrick County	103	$296,482	103	$296,482	0	$0
Morrill County	1	$7,024	1	$7,024	0	$0
Nance County	0	$0	1	$0	1	$0
Nemaha County	40	$221,249	53	$521,998	13	$300,749
Nuckolls County	2	$4,408	3	$7,069	1	$2,661
Otoe County	14	$88,772	19	$456,850	5	$368,078
Pawnee County	1	$0	1	$0	0	$0
Perkins County	0	$0	0	$0	0	$0
Phelps County	8	$72,240	8	$74,756	0	$2,516
Pierce County	5	$16,106	5	$16,106	0	$0
Platte County	73	$439,918	74	$440,877	1	$959
Polk County	1	$150	1	$150	0	$0
Red Willow County	10	$35,534	10	$35,534	0	$0
Richardson County	76	$1,670,402	87	$2,312,398	11	$641,996

Table 5 Comparison of 2010 and 2012 NFIP Claims Data

County	Total Claims 1978-11/08/10	Total Paid 1978-11/08/10	Total Claims 1978-11/20/12	Total Paid 1978 - 11/20/12	Difference in Claims	Difference in Total Paid
Saline County	116	$400,747	116	$400,747	0	$0
Sarpy County	968	$8,106,990	992	$8,937,901	24	$830,911
Saunders County	255	$2,110,673	257	$2,145,477	2	$34,804
Scotts Bluff County	24	$32,295	49	$171,847	25	$139,552
Seward County	21	$116,616	21	$116,616	0	$0
Sheridan County	0	$0	0	$0	0	$0
Sherman County	0	$0	1	$7,046	1	$7,046
Stanton County	13	$1,607,019	13	$2,950,402	0	$1,343,383
Thayer County	17	$174,713	17	$174,713	0	$0
Thurston County	16	$32,901	16	$32,901	0	$0
Valley County	5	$28,547	5	$28,547	0	$0
Washington County	97	$864,033	134	$2,403,017	37	$1,538,984
Wayne County	4	$1,495	4	$1,495	0	$0
Webster County	1	$1,727	1	$1,727	0	$0
Wheeler County	2	$7,763	2	$7,763	0	$0
York County	6	$0	7	$0	1	$0
State Total	**3,979**	**28,104,927**	**4,514**	**$40,523,288**	**535**	**$12,418,361**

Table 6 NFIP Repetitive Loss Claims in Nebraska

County	Number of Properties	Total Number of Claims	Total Value of Claims
Adams County	0	0	$0.00
Antelope County	0	0	$0.00
Blaine County	0	0	$0.00
Boone County	1	2	$7,152.89
Box Butte County	0	0	$0.00
Boyd County	1	2	$20,311.25
Buffalo County	1	3	$27,044.53
Burt County	0	0	$0.00
Butler County	0	0	$0.00
Cass County	36	89	$1,271,780.78
Cedar County	0	0	$0.00
Chase County	0	0	$0.00
Cheyenne County	1	2	$21,743.76
Clay County	0	0	$0.00
Colfax County	20	41	$734,458.19
Cuming County	0	0	$0.00
Custer County	0	0	$0.00
Dakota County	0	0	$0.00
Dawes County	0	0	$0.00
Dawson County	3	7	$22,792.54
Deuel County	0	0	$0.00
Dixon County	0	0	$0.00
Dodge County	43	114	$1,028,868.34
Douglas County	29	78	$500,907.06
Dundy County	0	0	$0.00
Fillmore County	0	0	$0.00
Franklin County	0	0	$0.00
Frontier County	0	0	$0.00
Furnas County	0	0	$0.00
Gage County	8	20	$140,704.20
Garden County	0	0	$0.00
Garfield County	0	0	$0.00
Gosper County	0	0	$0.00
Greeley County	0	0	$0.00
Hall County	3	8	$104,233.90
Hamilton County	1	3	$48,183.40
Harlan County	0	0	$0.00
Hayes County	0	0	$0.00
Hitchcock County	0	0	$0.00
Holt County	0	0	$0.00
Hooker County	0	0	$0.00
Howard County	0	0	$0.00
Jefferson County	0	0	$0.00

Table 6 NFIP Repetitive Loss Claims in Nebraska

County	Number of Properties	Total Number of Claims	Total Value of Claims
Johnson County	0	0	$0.00
Kearney County	0	0	$0.00
Keith County	0	0	$0.00
Knox County	0	0	$0.00
Lancaster County	3	6	$15,541.94
Lincoln County	0	0	$0.00
Loup County	0	0	$0.00
Madison County	2	4	$9,087.18
Merrick County	0	0	$0.00
Morrill County	0	0	$0.00
Nance County	0	0	$0.00
Nemaha County	1	2	$32,920.72
Nuckolls County	0	0	$0.00
Otoe County	1	2	$322,045.20
Pawnee County	0	0	$0.00
Perkins County	0	0	$0.00
Phelps County	0	0	$0.00
Pierce County	0	0	$0.00
Platte County	2	4	$26,078.28
Polk County	0	0	$0.00
Red Willow County	0	0	$0.00
Richardson County	18	58	$1,901,060.43
Rock County	0	0	$0.00
Saline County	4	8	$76,305.05
Sarpy County	136	333	$3,929,193.05
Saunders County	21	50	$601,338.28
Scotts Bluff County	0	0	$0.00
Seward County	1	2	$59,758.58
Sheridan County	0	0	$0.00
Sherman County	0	0	$0.00
Stanton County	0	0	$0.00
Thayer County	1	2	$5,648.26
Thurston County	1	2	$19,573.19
Valley County	0	0	$0.00
Washington County	16	40	$557,113.03
Wayne County	0	0	$0.00
Webster County	0	0	$0.00
Wheeler County	0	0	$0.00
York County	0	0	$0.00
State Total	**354**	**882**	**$11,483,844.03**

Table 7 2003 Mitigation Plan Action Items

2003 Flood Mitigation Plan Mitigation Category	2003 Flood Mitigation Plan Mitigation Action	2003 Flood Mitigation Plan Mitigation Action Description	Current Status	Comments/Future Action
Statewide Vulnerability Analysis	A. Historical Flood Information	Develop a statewide database of historical flooding data and make it more readily available to the public by posting searchable data online.	Partially complete. The database has been updated over time but has not been posted online. The NDNR reviews and distributes the information upon request.	Inconsistent public requests and need for this data along with limited staff time for completion made implementation a low priority.
	B. Baseline Determination	Assist communities with assessment of the number of structures that are in the floodplain within the community and that are at risk.	Mostly complete. Extensive implementation of County or NRD based Hazard Mitigation Plans have improved significantly the number of communities with structural inventories and vulnerability and risk assessments completed.	Some plans are not as detailed as others. Not all of the structural inventories are the same and may not be well described or mapped. If serious flood problems exist in a community, a more detailed assessment of structures at risk may still be needed for that community.
	C. State and Critical Facilities Identification	Develop a database of State of Nebraska Facilities and local critical facilities in order to determine level of risk for these facilities.	Partially complete. State facilities have been reviewed in the past for floodplain status but an update is required. Local critical facilities were assessed by local Hazard Mitigation Plans but individual location data and GIS mapping may be lacking.	A need for a more complrehensive database and GIS mapping remains.
	D. Unmet Mapping Needs	Develop floodplain maps that can be developed into future FIRM's for all Nebraska Counties.	Partially complete. DFIRM counties mapped and mapping quality have been greatly improved over the last 10 years. However, many counties within the State remain unmapped.	FEMA mapping priorities are population based while NDNR mapping priorities are based around available data, local needs, and map age. At this point, most population centers in Nebraska have new maps recently completed or underway. A need still exists for the NDNR to develop maps for areas with older data that also may not meet FEMA mapping priorities.
	E. Flood Mitigation Plans	Assist communities with development of detailed, community specific flood mitigation plans.	Mostly complete. In 2007, usage of stand-alone flood mitigation plans was reduced in favor of all hazards mitigation plans that include flood hazards. The majority of counties and communities in Nebraska now either have an adopted plan or have a plan pending.	The NDNR should continue to provide guidance as new plans are developed or existing plans are updated. There are opportunities for improvement regarding the level of community specific detail within the flooding sections of the all hazards plans. NDNR should encourage and support detailed local flood mitigation planning for communities with significant flood hazards.
	F. Publish Floodplain Delineations on the Internet	Develop online maps and tools for communities and the public to utilize to obtain floodplain information.	Complete, ongoing. The NDNR maintains an online interactive floodplain map with effective and draft flood delineation information. Also included are links to the effective FIRM panels.	Ongoing updates as new data becomes available are required. An assessment of user friendliness and ability to access advanced data is needed. Adding FIS documents to the list of accessible data should be considered.
	G. FEMA's Repetitive Loss List	Reconcile FEMA's repetitive loss list with actual field conditions and process updates to the list as needed. Develop a more accurate database of the repetitive loss properties.	Partially complete. A desktop audit effort to reconcile the repetitive loss list with actual field conditions has been completed based on existing data resources.	Field work and coordination with local authorities to further refine the list is needed. Follow up from this effort to update the list with FEMA is also needed.

Table 7 2003 Mitigation Plan Action Items

2003 Flood Mitigation Plan Mitigation Category	2003 Flood Mitigation Plan Mitigation Action	2003 Flood Mitigation Plan Mitigation Action Description	Current Status	Comments/Future Action
Interagency Cooperation	A. Develop an Interagency Flood Mitigation Task Force	Develop a formal task force to improve mitigatio n project coordination between NDNR and NEMA.	Partially complete. Coordination has been improved and is ongoing but a formal task force has not been developed.	Continue coordination and assess areas needing improvement. Continue to assess the potential for a formal task force.
	B. Post-Disaster Briefings	Coordinate NDNR staff attendance at post-disaster briefings.	Partially complete. NDNR staff have been involved in post-disaster mitigation meetings related to flooding, but the approach to these meetings may not have been consistently applied.	Continue to evaluate the most effective approach to NDNR's participation in post-disaster briefings.
	C. Coordination with the Nebraska Department of Roads	Coordinate with the Nebraska Department of Roads to assess flooding reduction opportunities that may corresponde to proposed roadway projects.	Partially complete. NDNR has an ongoing coordination contact with NDOR but formal coordination meetings have not been established.	Continue ongoing coordination with NDOR and evaluate the need for a more formal coordination meeting process.
Community Education/ Outreach	A. Mitigation Workshops	In coordination with NEMA, conduct mitigation education workshops around the State.	Complete, ongoing. NDNR and NEMA have consistently held workshops and training events each year.	Assessment of which areas within the State require the greatest focus for education and training events should be completed
	B. Nebraska Contact to Assist Local Communities (N-CALC)	Establish a routine outreach process via community meetings to discuss floodplain education and technical assistance topics.	Complete, ongoing. NDNR consistently maintains a routine process for outreach and meeting with multiple communities each year.	Assesment of whether refinements to the community outreach process are needed.
	C. Documents Explaining Flood Mitigation Planning	Develop flood mitigation project and planning education and outreach materials.	Partially complete. NDNR has developed several materials and also has access to FEMA guidance. However, some materials are out of date and need to be revised to reflect current programs.	Revise outreach materials and compile available flood mitigation educational tools to distribute to communities.
	D. Unplanned or Infrequent Opportunities	Be prepared to take advantage of ad hoc education or outreach opportunities.	Partially complete. NDNR has education materials and presentations on hand, but some may require revision.	Revise education materials and presentations to be consistent with current programs. Develop a repository for these materials so staff can easily access them when opportunities arise.
	E. Outreach and Educational Material Development	Develop floodplain management education and outreach materials.	Partially complete. NDNR has developed several materials and also has access to FEMA guidance. However, some materials are out of date and need to be revised to reflect current programs.	Revise outreach materials and compile available floodplain management educational tools to distribute to communities.

Table 8 Potential Mitigation Actions

Goal 1: Reduce or eliminate long term risk to human life.						
Objective/Recommendation	**Action**	**Responsible and Partner Agencies**	**Priority**			**Implementation Comments**
			Very High	High	Moderate	
1.1 Promote and support initiatives that protect or exclude human habitation in flood zones.	Encourage enforcement of existing zoning regulations by local authorities.	NDNR, NEMA, local authorities	X			Ongoing; continue implementation of education and outreach efforts.
	Support projects that advocate local governments to implement overall stormwater and floodplain management programs that manage long term growth and future development.	NDNR, NEMA, local authorities	X			Ongoing; project funding and grant availability may impact implementation.
1.2 Improve flood warning systems.	Identify population centers at risk to dam or levee failure and assess warning system improvements.	NDNR, NEMA, Silver Jackets, local authorities	X			Ongoing; dam failure risks are consistently assessed but knowledge of levee failure risks requires improvement. NRD and local involvement is important for this action.
	For jurisdictions with risk from ice jams, encourage continued development of ice jam monotoring and response procedures.	NDNR, NEMA, Silver Jackets, local authorities		X		Ongoing; the primary jurisdictions subject to this risk have established monitoring and response programs.
Goal 2: Reduce or eliminate long term risk to property and/or the environment.						
Objective/Recommendation	**Action**	**Responsible and Partner Agencies**	**Priority**			**Implementation Comments**
			Very High	High	Moderate	
2.1 - Effective development and growth management to minimize flooding risks for new structures and to preserve the natural and beneficial functions of flood hazard areas.	Promote adoption of building codes and building permitting and inspection practices that support floodplain management objectives.	NDNR, local authorities	X			Ongoing; continue implementation of education and outreach efforts.
	Encourage enforcement of existing zoning regulations by local authorities.	NDNR, NEMA, local authorities	X			Ongoing; continue implementation of education and outreach efforts.
	Support projects that advocate local governments to implement overall stormwater and floodplain management programs that manage long term growth and future development.	NDNR, NEMA, local authorities	X			Ongoing; project funding and grant availability may impact implementation.
2.2 - Mitigation of flood hazards for existing structures.	Update and keep current Nebraska repetitive loss and severe repetitive loss property information.	NDNR, FEMA, NEMA, NRDs, local authorities	X			Ongoing; review of the current repetitive loss properties and coordination with communities to refine the list is needed. Potential opportunities exist for communities and NDNR to review repetitive loss property status as part of participation in the CRS program.
	Pursue acquisition/demolition, elevation, basement fill, relocation, wet or dry flood proofing projects; support implementation of insurance programs.	NDNR, NEMA, local authorities	X			Ongoing; project funding and grant availability may impact implementation. Typically will be pursued as funding opportunities arise or as a follow up to a flooding event.

Table 8 Potential Mitigation Actions

	Identify population centers at risk to dam or levee failure.	NDNR, NEMA, NRDs, USACE, local authorities	X			Ongoing; dam failure risks are consistently assessed but knowledge of levee failure risks requires improvement. NRD and local involvement is important for this action.
	Consider flood control projects such as flood retention reservoirs, small dam or levee structures, and other flood control structures when this is the most viable, cost effective, and environmentally acceptable alternative.	NDNR, NEMA, NRD's, local authorities	X			NRD and local authorities continue to assess and implement these actions. NDNR encourages non-structural mitigation alternatives where feasible.
	Support maintenance of stream bank stability projects that also assist with infrastructure protection and/or flood risk reduction.	NDNR, NEMA, NRD's, local authorities		X		Ongoing; NDNR supports these actions by providing flood data where available. NDNR and NEMA may also provide technical assistance related to funding when these actions mitigate hazards to structures at risk.
2.3 - Protection of State facilities and local critical facilities.	Develop a database of State facilities and local critical facilities.	NDAS, NDNR, local authorities	X			Improvements are needed to mapping of State facilities for assessment of flood risk . Local critical facility mapping data requires more comprehensive compilation.
	Support plans for floodproofing of critical facilities that cannot feasibly be relocated out of flood hazard areas.	NDNR, local authorities		X		Development of a list of critical facilities that would potentially benefit from floodproofing is required.
Goal 3: Promote public awareness of flooding hazards and post-flooding response.						
Objective/Recommendation	**Action**	**Responsible and Partner Agencies**	**Priority**			**Comments (implementation timeline and/or funding)**
			Very High	High	Moderate	
3.1 - Provide educational opportunities to the public to learn about flood risk awareness, floodplain management, and post-flooding response.	Promote public awareness of all flooding risks including rivering flooding, flash flooding, ice jam flooding, dam failure, and levee failure.	NEMA, NDNR, NRDs, NWS, Silver Jackets		X		Ongoing; continue implementation of education and outreach efforts. Work with NRDs to develop outreach efforts and distribute information.Work with communities during assistance visists and other meetings to talk about the types of flooding risks of concern to the community.
	Develop a database of historical flooding data that is accessible to the public.	NDNR			X	Ongoing; assess available flood history data and ability to implement a publicly available database.
	Promote projects to increase public awareness concerning flood insurance and flood awareness education.	NDNR, NEMA, local authorities	X			Ongoing; continue implementation of education and outreach efforts. Work with NRDs to develop outreach efforts and distribute information.
3.2 - Provide educational opportunities to insurance agents, realtors, and lenders.	Provide training regarding basic floodplain data and insurance topics.	NDNR		X		Ongoing; continue implementation of education and outreach efforts.
	Provide training regarding implementation of ICC coverage and associated mitigation opportunities.	NDNR		X		Ongoing; continue implementation of education and outreach efforts. Incorporate ICC education into annual training efforts.

Table 8 Potential Mitigation Actions

Goal 4: Provide technical assistance to communities, State agencies, and Federal agencies to assist with identification of flood hazards and mitigation opportunities.						
Objective/Recommendation	**Action**	**Responsible and Partner Agencies**	**Priority**			**Implementation Comments**
			Very High	High	Moderate	
4.1 - Provide best available floodplain mapping and regulatory data for floodplain management purposes.	Improve floodplain mapping in areas without detailed floodplain maps or that have outdated maps based on NDNR and FEMA mapping priorities.	NDNR, FEMA, NRD's, local authorities	X			Ongoing; update maps according to NDNR priorities and available funding opportunities.
	Maintain online access to floodplain maps and data.	NDNR	X			Ongoing; update online data as needed.
4.2 - Assist communities with training and information needed to enhance floodplain management knowledge and effort.	Develop floodplain management outreach materials and complete community outreach, including community visits.	NDNR, FEMA, NEMA, NRD's, local authorities		X		Ongoing; continue implementation of education and outreach efforts.
	Provide counties/communities with general information on repetitive loss areas for planning purposes.	NDNR	X			Ongoing; completed upon request and in conjunction with mitigation plan development.
	Promote continued implementation and updates of all-hazards hazard mitigation plans that include assessment of flooding risks.	NDNR, NEMA, NRD's	X			Ongoing; plans are updated every five years as required. NDNR will encourage more thorough and detailed flood mitigation assessments as part of the plan updates.
	Provide floodplain management and risk mitigation training opportunities.	NDNR, NEMA, NRD's	X			Ongoing; NDNR and NEMA provide training opportunities annually.
	Develop mitigation tools and procedures guidance for distribution to local authorities in order to provide project development and implementation guidance.	NDNR, NEMA		X		Ongoing; NDNR plans to implement development of this information during 2013.
	Provide technical assistance to communities to develop viable, cost effective flood mitigation projects.	NDNR	X			Ongoing; completed upon request and in conjunction with mitigation project development.
	Encourage communities to consider joining the NFIP Community Rating System (CRS) program.	NDNR, NRDs	X			Ongoing; NDNR plans to work with NRDs, counties, and communities during 2013 to identify candidates for joining CRS and help develop applications for interested communities or counties.
	Encourage communities to adopt and enforce higher regulatory standards for floodplain management.	NDNR		X		Ongoing; continue implementation of education and outreach efforts.
4.3 - Coordinate with State and Federal agencies regarding disaster response and mitigation opportunities.	Improve agency coordiation for flood mitigation projects including post-disaster coordination.	NDNR, NEMA	X			Ongoing; continue to work with NEMA regarding review and implementation of potential flood mitigation projects.
	Coordinate with Nebraska Department of Roads to determine roadway projects which could also contain a flood reduction component.	NDNR, NDOR, NEMA		X		Ongoing; continue to work with NDOR to identify opportunities.

APPENDIX C

STATE HAZARD MITIGATION PLAN AND LOCAL HAZARD MITIGATION PLANS

APPENDIX D

2003 STATE OF NEBRASKA FLOOD MITIGATION PLAN

APPENDIX E

NEBRASKA FLOODING HISTORY SUMMARY

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Non-riverine flooding	March 23, 1960	98	Anselmo		Unknown			Snowmelt from Othello Valley hills. 8 families evacuated, water 2.5' deep in streets
	June 21, 1960		Omaha		N/A			Heavy rain caused stormwater flooding. Dodge Street the only E-W road open in City
	June 15, 1967	228	Kenesaw		Unknown			
	June 15, 1967	228	Minden		Unknown			4" rain knocked out three power sub-stations
Antelope Creek	June 2, 1951		Lincoln		N/A			28th/D-waist deep;33rd/Normal-1';27th/Holdrege;cars stalled-Cornhskr Blvd.
Antelope Creek	June 14, 1951		Lincoln	$2,000,000	N/A			92 businesses, 298 homes, RR flooded - 8" rain in 4 hours, water 3' deep on O St., heavy damage to Antelope Park
Antelope Creek	June 27, 1952		Lincoln	$63,000	N/A			2.18" rain reports around Lincoln, flooding along entire length of stream
Antelope Creek	July 1, 1957		Lincoln		N/A			4.5" rain and 2.5-3.5" basin-wide, flooding along entire length of stream
Antelope Creek	May 24, 1958		Gordon		N/A			17.86'/444 cfs
Antelope Creek	July 10, 1958		Lincoln		N/A			11.99'/2800 cfs; 135 homes flooded; 7.7" rain in upper basin, 4.1" in lower, 1.35" in 35 min.; 30 fam evac, 48th&Normal, 19th&U, Vine
Battle Creek	May 2007	1714	Battle Creek		$3,191,482.25 (2007 dollars)			
Battle Creek	June 2008		Battle Creek		N/A			
					N/A			
Bazille Creek	June 16, 1957		Niobrara		N/A			19.96'/68,600 cfs
Beaver Creek	June 7, 1929		Petersburg, Loretto, Albion		N/A			Numerous bridges (24',60',40',36') destroyed or washed out
Beaver Creek	June 2, 1950		Loretto		N/A			4,570 cfs peak
Beaver Creek	June 2, 1950		Albion		N/A			Water impacted 20-30 blocks, but no evacuations
Beaver Creek	June 2, 1950		St. Edward		N/A			Moderate flood damaged 5 homes and washed out U.P. RR bridge
Beaver Creek	June 2, 1950		Genoa		N/A			8,470 cfs
Beaver Creek	July 9, 1950		York		N/A			13.15" in 12 hours caused an approximate 500-year recurrence interval flood, 2' clearance under Lincoln Ave. overpass - greatest known flood
Beaver Creek	July 9, 1950		Genoa		N/A			9100 cfs - higher than record crest set 6/2/50
Beaver Creek	July 9, 1950		Beaver Crossing		N/A			Almost all of business district and most of residential district flooded - greatest known flood
Beaver Creek	July 19, 1950		Genoa, Loretto		N/A			Genoa: 20.03'/21,200 cfs highest ever recorded, broke 7/9/50 record (NOAA now puts crest at 18.70')
Beaver Creek	March 21, 1960	98	Stamford		Unknown			Beaver and Sappa Creeks were 3-4' over flood stage (FS)
Beaver Creek	March 23, 1960	98	Beaver City		Unknown			20.03' with 5,690 cfs discharge
Beaver Creek	March 24, 1960	98	Lebanon, Danbury		Unknown			2 families evacuated in Danbury
Beaver Creek	June 23, 1966		Beaver City	$505,000	N/A			20.85'/8,070 cfs
Beaver Creek	August 13, 1966	221	St. Edward		Unknown			14,200 cfs - St. Edward completely flooded - 71 homes and 42 businesses damaged, many basements flooded
Beaver Creek	August 13, 1966	221	Genoa		Unknown			19.39'/14,200 cfs. Colfax Co.-$402K gen.; Greeley-$875K ag;Valley-$250K gen.
Beaver Creek	June, 1967	228	Genoa		Unknown			13.84' at 14,400 cfs
Beaver Creek	June 15, 1967	228	Beaver City		Unknown			6" rain
Beaver Creek	February 19, 1971	303	St. Edward		Unknown			6470 cfs - water on Main St. 1' deep, damaged 12 homes and 12 businesses despite flood fighting efforts
Blacksnake Creek	June 21, 1960		Elgin		N/A			Unofficial 7" of rain closed roads, flooded part of town
Big Blue	Spring 1851				N/A			Military supply train forced to ferry across at Marysville
Big Blue	April 6, 1867		Seward County		N/A			2' of wet snow 4/1-4/5, then rapid melting 4/6
Big Blue	March 1881		Beatrice		N/A			Combo of ice jam and rain run-off led to many bridges being lost
Big Blue	April 24, 1897		Wilber		N/A			4 inches of rain
Big Blue	July 5-10, 1902		Crete, Wilber, DeWitt		N/A		Ext. ag. losses	8.06 inches of rain from July 5 - July 10
Big Blue	July 5-10, 1902		Beatrice		N/A			Caused the City to raise the waterworks 4 feet
Big Blue	May 24-31, 1903		DeWitt		N/A			Some parts of watershed received over 9 inches of rain in period
Big Blue	May 24-31, 1903		Crete	$4,000	N/A			6.87" rain, damages were for flour mills in Crete
Big Blue	May 24-31, 1903		Beatrice		N/A			Stage=25.6', 32,300 cfs from 7-8 inches of rain
Big Blue	June 28, 1908		Beatrice		N/A			22.2' stage/25,800 cfs. Beatrice Creamery damaged, basements flooded
Big Blue	July 6, 1909		Beatrice		N/A			18.6'/20,000 cfs
Big Blue	July 23, 1911		Beatrice		N/A			26.0'/33,000 cfs - large portion of residence section of City flooded, people evacuated

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Big Blue	March 20, 1912		Beatrice		N/A			19.5'/21,600 cfs
Big Blue	June 16, 1914		Beatrice		N/A			16.3'/12,300 cfs
Big Blue	Feb. 18, 1916		Beatrice		N/A			18.0'/16,400 cfs
Big Blue	Sept. 27, 1923		Crete, Seward, DeWitt		N/A			
Big Blue	June 8, 1941		Barneston, Holmesville	$786,900	N/A			Barneston: 34.30'/57,700 cfs - from 5.05" rain, river gauge destroyed by water, flood of record
Big Blue	June 8, 1941		Beatrice	$12,000	N/A			26.3'/27,900 cfs
Big Blue	June 8, 1941		Seward		N/A			Seward: 31,000 cfs
Big Blue	Sept. 16, 1941		Barneston	$28,000	N/A		$115,000 agr.	Damages were to roads only and over entire flooded area; 34.3'/57,700 cfs
Big Blue	Sept. 16, 1941		Beatrice		N/A			26.3' crest/27,900 cfs from 4.81" rain inundated homes, businesses, parks, and railroad. Second flood in 3 months
Big Blue	May 11, 1942		Beatrice		N/A			17.6'/10,800 cfs
Big Blue	June 13, 1943		Beatrice		N/A			20.2'/14,900 cfs
Big Blue	June 13, 1944		Beatrice		N/A			20.2'/14,800 cfs
Big Blue	June 23, 1947		Beatrice	$75,000	N/A		ext. ag. losses	27.65'/31,800 cfs, 20,000 acres flooded, flooding in Glenover Subdivision and south part of city left 263 homeless
Big Blue	June 22, 1947		Crete		N/A			Crete height=22.8'
Big Blue	March 22, 1948		Beatrice	$166,250	N/A			22.9'/20,100 cfs - 85% of damages were urban
Big Blue	March 1, 1948		Crete		N/A			Crete stage=25.9'
Big Blue	March 9, 1949		DeWitt	$420,000 (total)	N/A			Damages were 75% urban, 25% agricultural; 19,300 acres flooded
Big Blue	March 9, 1949		Seward	$250,000	N/A			Record crest of 21.6'
Big Blue	March 9, 1949		Beatrice		N/A			24.9'/24,300 cfs
Big Blue	March 9, 1949		Crete		N/A			27.0'/20,900 cfs
Big Blue	May 8, 1950		Wymore	$150,000	N/A			160 people evac; flood of record - 10'9" over FS; damages were industrial
Big Blue	May 8, 1950		DeWitt	$105,000	N/A			11,000 acres flooded overall in entire flooded area, see Turkey Creek
Big Blue	May 9, 1950		Beatrice	$69,000	N/A	2		24.65'/23,600 cfs - 17 basements flooded, 8 mi. of U.P. RR washed out, 2 died - car washed away
Big Blue	May 9, 1950		Crete	$16,000	N/A			28.74'/27,600 cfs - 96" of water poured over the dam between Big Blue and Crete
Big Blue	July 10, 1950		Crete		N/A	5		New record: 28.74' at 27,600cfs; 18-year flood; lower parts of town flooded
Big Blue	June 2-4, 1951		David City, York	$1,072,300 (T)	N/A	3	Trans: $1.25M	18,600 acres under water, flood caused by long-duration rains
Big Blue	June 2-4, 1951		Beatrice		N/A			28.3'/31,700 cfs - broke dikes, 75 homeless, 150 homes, 24 businesses inundated. Most damage ever.
Big Blue	June 2-4, 1951		Crete		N/A			28.30'/25,500 cfs; 12' over FS, 200 families evacuated, 90 square blocks inundated
Big Blue	June 2-4, 1951		Wilber		N/A			Flood 6" higher than previous record set in 1950
Big Blue	June 2-4, 1951		Milford		N/A			1.5' higher than previous record flood stage
Big Blue	June 2-4, 1951		Saunders County		N/A		$200,000	Damages = estimated cost to repair 100 bridges lost in flood
Big Blue	June 2-4, 1951		DeWitt		N/A			Record flood
Big Blue	June 2-4, 1951		Seward	$633,300	N/A		Ag: $1,573,220	Higher crest than March, 1949; 49 families evacuated; 22.3'/27,600 cfs
Big Blue	June 2-4, 1951		Ulysses		N/A			Record crest of 21.0'
Big Blue	July 7, 1951		Barneston		N/A			Crest of 22.0' (FS=18.0')
Big Blue	July 7, 1951		DeWitt		N/A			Swan Cr. flooded Main St. 1 foot
Big Blue	July 7, 1951		Seward		N/A			25,500 cfs, 15-year flood
Big Blue	July 15, 1952		Beatrice		N/A			Beatrice: 27.0' (flood stage = 16.0')
Big Blue	July 15, 1952		Barneston		N/A			Barneston: 27.5' (flood stage=18.0')
Big Blue	July 15, 1952		Crete		N/A			Crete: 27.0' (flood stage = 16.0')
Big Blue	July 15, 1952		Wilber		N/A			4.5" rain in 45 min. flooded homes/bus basements. Evac/Rescued people
Big Blue	August 8, 1954		Beatrice		N/A			22.4'/19,000 cfs
Big Blue	July 3, 1956		Beatrice		N/A			19.9'/13,400 cfs
Big Blue	June 19, 1957		Crete		N/A			27.50'/22,200 cfs
Big Blue	June 21, 1957		Seward, DeWitt		N/A			Seward: 22.34' at 15,300 cfs, 33-year flood
Big Blue	June 21, 1957		Beatrice		N/A			23.4'/19,300 cfs
Big Blue	May 7, 1959		Beatrice		N/A			20.7' crest (FS=16.0'), 14,600 cfs
Big Blue	May 7, 1959		Barneston		N/A			Barneston crest of 20' (FS=18')

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Big Blue	March 30, 1960	98	Seward, Crete	$101,800	Unknown			Crete: 28.0' crest/23,000 cfs, $6,800 of damage from urban areas
Big Blue	March 31, 1960	98	Beatrice	$39,200	Unknown			25.7'/23,500 cfs, 30-50 families evacuated, all damages urban
Big Blue	March 28, 1960	98	Barneston		Unknown			Barneston: crest of 27.55' (FS=18.0')
Big Blue	June 22, 1960		Crete		N/A			21' crest, lowland flooding. 5' over FS
Big Blue	March 25, 1962		Crete		N/A			Crest of 20' (16' FS)
Big Blue	June 25, 1963		Staplehurst		N/A	1		Many bridges out
Big Blue	June 25, 1963		Ulysses		N/A			Crest of 25' (15'FS)
Big Blue	June 25, 1963		Seward		N/A			Crest of 21.82'
Big Blue	June 25, 1963		Crete		N/A			23.23'/7930 cfs - Water 4' deep in some yards on north side of town (Walnut Creek backup)
Big Blue	June 25, 1963		DeWitt		N/A			Turkey and Swan Cr. also flooding, water 3' deep, every block had water
Big Blue	June 25, 1963		Beatrice		N/A			24.6'/21,500 cfs - W. Court St closed, Chatauqua Park flooded, Front St and Center to Bluff St flooded
Big Blue	June 30, 1965		Beatrice		N/A			23.1'/19,500 cfs
Big Blue	Feb. 11, 1966		Ulysses		N/A			4' over banks
Big Blue	May 22-27, 1965		Crete		N/A			Crest of 20.2' on May 23 was 4.2' over flood stage
Big Blue	June 10, 1967	228	York, Ulysses	$2,300,000 (T)	Unknown		Ag: $2,143,500	Rainfall 2X normal June precip;40K acres flooded;Ulysses:crest of 21' (15' FS)
Big Blue	June 10, 1967	228	Seward		Unknown			Record 22.8' crest/24,300cfs;15 fam evac, river 2-3 mi wide at Blue/Lincoln Cr.
Big Blue	June 10, 1967	228	Beatrice		Unknown			26.6'/25,500 cfs; Damage: $19,400 urban;$27,800 transportation;$5000 utilities; 50 homes flooded
Big Blue	June 10, 1967	228	Crete		Unknown			Record 12' over FS of 29.83'/24,300cfs; Main St. 3' under, many homes evacuated
Big Blue	June 10, 1967	228	Milford		Unknown			10-15 homes flooded
Big Blue	June 10, 1967	228	DeWitt		Unknown			20 homes evacuated
Big Blue	June 10, 1967	228	Falls City		Unknown			35" rain from May 26 - June 16 near annual average
Big Blue	June 10, 1967	228	Barneston		Unknown			Barneston: 26.1' crest with 26,000 cfs
Big Blue	June 10, 1967	228	Surprise		Unknown	1		Some evacuations, nearly every basement full of water
Big Blue	March 25, 1969		Beatrice		N/A	1		23.2'/18,700 cfs
Big Blue	March 25, 1969		Barneston		N/A			Blue River 5' over flood stage
Big Blue	March 25, 1969		Crete		N/A			Blue River 5' over flood stage
Big Blue	October 12, 1973	406	Beatrice	$5,000,000 (est.)	Unknown			32.95' - 16.95' over flood stage; 49,100 cfs
Big Blue	October 12, 1973	406	Blue Springs	$7,000	Unknown			
Big Blue	June 13, 1984	716	Beatrice		Unknown			31.27'/55,100 cfs - greatest flow rate of record since 1902 - 30 homes flooded, 75-year flood
Big Blue	June 14, 1984	716	Barneston		Unknown			30.21'/55,800 cfs the second-largest discharge in 53 years of record - 100-year flood
Big Blue	July 26, 1993	998	Beatrice		$47,799,461.00 (1993 dollars)			Crest of 28.77'/third highest historic crest at Beatrice.
Big Blue	May 6, 2007	1706	Beatrice		$8,063,125.34 (2007 dollars)			Rainfall of 4-5 inches over the Blue River Basin from May 4 - May 6. The river reached a crest of 23.9 feet, about 7.9 feet above flood stage, on May 7th in Beatrice.
West Fork Blue	August 21, 1922		Hastings		N/A			3.8" rain in short period flooded streets and basements
West Fork Blue	July 10, 1950		Dorchester	$734,200	N/A			24.8'/49,400 cfs
West Fork Blue	July/Aug, 1961		Hastings		N/A			No detailed information available
West Fork Blue	July, 1962		Hastings		N/A			No detailed information available
West Fork Blue	Sept., 1963		Hastings		N/A			No detailed information available
West Fork Blue	May, 1965		Hastings		N/A			No detailed information available
West Fork Blue	June 15, 1967	228	Dorchester		Unknown			Crest of 20' (FS=15')
West Fork Blue	June 24-26, 1968		Hastings, Juniata, Riverdale		N/A			West Fork Big Blue flooding
West Fork Blue	March 25, 1969		Dorchester		N/A			Crest of 21' (FS=15')
West Fork Blue	June 21, 1977		Hastings		N/A			No detailed information available
Little Blue	1898		Fairbury		N/A			
Little Blue	June 1, 1935				N/A			
Little Blue	June 9, 1941		Endicott		N/A			New record: 16.23' at 31,000 cfs
Little Blue	June 2-4, 1951		Endicott		N/A			5' over flood stage
Little Blue	June 27, 1951		Endicott		N/A			4.5-5" rain flooded basements, Big Sandy also flooded; 20,300 cfs

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Little Blue	June 27, 1951		Fairbury		N/A			16.82'/36,800 cfs, 40-year flood
Little Blue	June 17, 1957		DeWeese		N/A			Record crest of 12.0'
Little Blue	May 5, 1959		Fairbury		N/A			Crest of 11.0' (FS=9.0')
Little Blue	March 28, 1960	98	Gilead		Unknown			17.30'/25,600 cfs
Little Blue	March 29, 1960	98	Fairbury		Unknown			15.8'/31,700 cfs - 25-year flood; evacuations. Gage washed away during flood, so could have been higher
Little Blue	March 29, 1960	98	Hebron		Unknown			Little Blue 1' over FS
Little Blue	March 29, 1960	98	DeWeese		Unknown			Crest of 12.35' (FS=6.0')
Little Blue	May 22, 1965		DeWeese		N/A			Exceeded record crest of 1957 by 1.3' (13.3')
Little Blue	June 15, 1967	228	DeWeese		Unknown			Crest of 12' (FS=8')
Little Blue	June 15, 1967	228	Fairbury		Unknown			Crest of 13' (FS=10')
Little Blue	June 27, 1968		DeWeese		N/A			Crest of 12.4', 5587 cfs
Little Blue	March 20, 1969		DeWeese, Fairbury		N/A			Flooding reported - no specific information
Little Blue	October 12, 1973	406	Fairbury		Unknown			18.96'/37,800 cfs, 45-year flood - highest flood but not highest discharge
Little Blue	June 13, 1984	716	Fairbury		Unknown			16.98'/41,900 cfs the greatest discharge for the period of record - 50-year flood
Little Blue	July 24, 1992	954	Fairbury		$1,788,512.00 (1992 dollars)			6-8" rain fell in basin, record flows and stage were recorded - no exact information given
Big Sandy Creek	June 13, 1984	716	Alexandria		Unknown			21,900 cfs the greatest discharge in 5 years of records
Big Sandy Creek	July 24, 1991		Alexandria		N/A			Record stages were set after 6-8" rain fell in watershed
Brawner Creek	August 18, 1968		Fairbury		N/A			Water across Hwy 136 and across fairgrounds. People evacuated from homes on Converse Street.
Brushy Creek	June 21, 1947		Maywood		N/A			30.4'/70,000 cfs (discharge estimated)
Buffalo Creek	June 4, 1885		Fairfield		N/A			3 mi. of RR track washed out, mill property in danger
Buffalo Creek	June 22, 1947		Darr		N/A			18.4'/9000 cfs
Buffalo Creek	June 22, 1947		Lexington		N/A			200 basements flooded; Spring Creek also flooding; 9,000 cfs discharge at Darr
Buffalo Creek	March 24, 1960	98	Lexington		Unknown			40 homes inundated
Cedar	July 18, 1950		Spalding		N/A			Spalding:Heavy rains caused record stage and discharge
Cedar	July 18, 1950		Fullerton		N/A			9.64'/10,100 cfs
Cedar	March 28, 1960	98	Belgrade		Unknown			8.64'/2600 cfs (backwater from ice jam)
Cedar	March 28, 1960	98	Fullerton		Unknown			11.75'/4300 cfs (backwater from ice jam)
Cedar	8/14-8/16, 1966	221	Cedar Rapids		Unknown			Minor damage to businesses on the River, bridges into town damaged, river cut a new channel
Cedar	8/14-8/16, 1966	221	Fullerton		Unknown		livestock, bridges	14.90'/64,700 cfs - record flooding. Timber Creek backed-up, 7' over road; much damage to U.P. RR facilities
Center Creek	Sept. 20, 1950		Franklin		N/A			6.8'/3150 cfs (crest information taken from floodmark off datum then in use)
Chadron Creek	August 29, 1954		Chadron		N/A			13.72'/1610 cfs
Cole Creek	August 6/7, 1999	1286	Omaha		$2,421,277.00 (1999 dollars)	1		Up to 10" of rain reported overnight from Omaha to Tekamah. Man killed when basement collapsed on him.
Coon Creek	April 18/19, 1942		Indianola		N/A			Flood of record - 22,000 cfs, caused by high-intensity rainfall
Cottonwood Creek	July 28, 1951		Dunlap		N/A			20.10'/28,100 cfs
Cottonwood Creek	August 3, 1959		Prague		N/A			4780 cfs on North Fork - 12 inches of rain left floodwater 5 feet deep in streets, livestock losses
Davis Creek	June 15, 1967	228	Osceola		Unknown			12 homes flooded,elderly home evac,water upto 2' in town,basements flooded
Dead Horse Creek	June 17, 1954		Loup City		N/A			Over 5" rain caused 2410 cfs in Creek. No stage reading available
Dry Creek	June 21, 1947		Curtis		N/A			27.7'/25,900 cfs (discharge taken almost 3 miles upstream)
Elk Creek	June 19, 1951		Jackson		N/A			Half of town inundated due to heavy rains
Elk Creek	March 25, 1962		Jackson, Willis		N/A			Ice jam - 15-25 families ready to evacuate
Elkhorn	August 12, 1823				N/A			Storm felled giant trees, damaged Indian summer camp, Elkhorn a "torrent"
Elkhorn	Spring, 1857		West Point		N/A			River overflowed annually, riverside saw and flour mills suffered as town founded to use river's current
Elkhorn	May/June, 1873		West Point		N/A	1		U.P. train derailed in Elkhorn - killed one, east of mill dam flooded up to RR
Elkhorn	May/June, 1873		Hooper		N/A			Channel capacity of Elkhorn at Hooper is 24,500 cfs
Elkhorn	March 28, 1881		Waterloo		N/A			4 foot rise of flood waters lifted Union Pacific RR bridge off its foundation
Elkhorn	March 31, 1881		West Point		N/A			Water 6 feet above normal and still rising, ice jams partially responsible

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Elkhorn	March 31, 1881		Hooper		N/A			Townfolk built raft and used wire cables to ferry wagons across swollen Elkhorn
Elkhorn	April 21, 1881		Norfolk		N/A			Water had "free reign" in city, water 2-3' in streets, 1/2-mile RR track and 2 RR bridges washed out
Elkhorn	April 21, 1881		Neligh		N/A			Rairoad bridge held but approaches were damaged
Elkhorn	May 27, 1888		Neligh		N/A			Mill dam completely submerged, RR traffic halted after bridges washed out
Elkhorn	June 24, 1891		West Point	$65,000	N/A			7.3" rain transformed streets to streams floated buggies/wagons, water washed out new gutter system
Elkhorn	July, 1902		Hooper		N/A			No further information available
Elkhorn	May, 1903				N/A			No further information available
Elkhorn	June, 1905				N/A			No further information available
Elkhorn	March 27, 1912		Hooper		N/A			Record snowfall led to combination of melting and ice jam flooding
Elkhorn	March 27, 1912		West Point	$125,000	N/A			Valley looked like a sea with islands, all bridges in Dodge Co. inoperable (damage est for bridges only)
Elkhorn	March, 1917		Norfolk		N/A	3		Two floods. Melting snow sent floodwaters to highest mark yet in Norfolk, flooded homes
Elkhorn	May, 1917		O'Neill		N/A			Rare flooding washed out one bridge and submerged another
Elkhorn	May, 1917		Neligh		N/A			Record stage, breached dike for mill dam, flooded Riverside Park
Elkhorn	May 29, 1917		Norfolk		N/A			Farmers awoke to find low-lying pastures submerged, boys caught stranded fish in pastures
Elkhorn	April 20, 1920		Inman		N/A			Record stage caused by snowmelt and rain, roads impassable for miles
Elkhorn	April 20, 1920		Ewing		N/A			Elkhorn two miles wide
Elkhorn	April 20, 1920		Neligh		N/A			Water rose 18" in 24 hours, destroyed dam for mill, switched from hydro to diesel power for mill
Elkhorn	April 20, 1920		West Point		N/A			1 foot of snow and 5 inches of rain made for the worst flooding since 1888. Bridges and roads damaged
Elkhorn	April 20, 1920		Tilden		N/A	1		Man killed while trying to ferry across river, boat overturned
Elkhorn	April 20, 1920		Norfolk		N/A			Channel change stranded 30 people on island. Channel was where river had been diverted by a dike
Elkhorn	June 2, 1940		Norfolk		N/A			4' rise in 2 hours, Highway 275 closed, some sections washed out
Elkhorn	June 2, 1940		Pilger		N/A			Humbug Creek broke levees, flooded power station
Elkhorn	June 2, 1940		West Point		N/A		1200 chickens	Many evacuations, crested 13' above normal, 85 tons of debris and carcasses removed from streets
Elkhorn	June 2, 1940		Stanton		N/A			Mud destroyed corn crop
Elkhorn	June 2, 1940		Arlington		N/A			Highest water since the ice gorge of 1912
Elkhorn	June 2, 1940		Winslow		N/A			Logan Creek and Elkhorn covering great stretches of farm land
Elkhorn	June 2, 1940		Nickerson		N/A			Maple Creek and Elkhorn flooding large areas, 60 farms
Elkhorn	June 10-12, 1944		Hooper		N/A			Worst flood to date
Elkhorn	June 10-12, 1944		Arlington		N/A			Worst flood to date
Elkhorn	June 10-12, 1944		Waterloo		N/A			Record 100,000 cfs, 16.6' gage height. (May be a different river gage now)
Elkhorn	June 10-12, 1944		Scribner, Winslow	$378,000	N/A			Elkhorn and Pebble Creek both flooding in both towns
Elkhorn	June 5, 1947				N/A			No further information available
Elkhorn	June 23-26, 1947		Norfolk, Neligh, Oakdale, Tilden		N/A			Norfolk: 11.1'/12,600 cfs; Neligh: 11.7' (1.7' over FS)
Elkhorn	Feb. 28, 1948		Norfolk		N/A			12.25' stage caused by backwater of an ice jam
Elkhorn	March 11, 1949		Norfolk		N/A			13.63' stage (Ice jam caused flood)
Elkhorn	April 7, 1949		Ewing		N/A			11.32'/7280 cfs
Elkhorn	March 25, 1951		West Point		N/A	1		Plum Creek also flooding. Crest=14.15' (FS=11.0'). Ice jam, melting snow flood
Elkhorn	3/29-4/5, 1960	98	Norfolk		Unknown			8.6' with 13,500 cfs, 10-year flood
Elkhorn	3/29-4/5, 1960	98	Wisner		Unknown			South section of town evacuated
Elkhorn	3/29-4/5, 1960	98	Arlington		Unknown			No further information available
Elkhorn	3/29-4/5, 1960	98	Hooper		Unknown			46,900 cfs, 8-10 city blocks flooded
Elkhorn	3/29-4/5, 1960	98	Scribner		Unknown			1/4 of town flooded
Elkhorn	3/29-4/5, 1960	98	West Point		Unknown			1/3 of town flooded; 1 home dest; 16' crest; 40,000 cfs, 33-year flood
Elkhorn	3/29-4/5, 1960	98	Winslow, Pilger		Unknown			Water 2-5' deep over entire town, Pilger to Scribner river 2-3' over FS

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Elkhorn	April 5, 1960	98	Waterloo		Unknown			46,900 cfs
Elkhorn	June 21, 1960		Scribner		N/A	1		30 families evacuated, highway 275 closed
Elkhorn	June 21, 1960		Arlington		N/A			Closed streets/bridges.
Elkhorn	June 21, 1960		Battle Creek		N/A			5" rain, 12 families evacuated
Elkhorn	June 21, 1960		Meadow Grove		N/A			8 families evacuated in NW part of town
Elkhorn	June 21, 1960		Stanton, Waterloo		N/A			Some families evacuated. Waterloo:13' crest
Elkhorn	3/25-4/1, 1962		Hooper		N/A			50,200 cfs, ice jam, 12 families evacuated
Elkhorn	3/25-4/1, 1962		Schuyler		N/A			Shell Creek, Lost Creek, Maple Creek all flooding
Elkhorn	3/25-4/1, 1962		West Point		N/A	1		Ice jam flooded 10 blocks, 300 evacuated, 100' of highway 275 bridge washed out
Elkhorn	3/25-4/1, 1962		Waterloo		N/A			60% of population evac, 3' water downtown; 50,200 cfs
Elkhorn	3/25-4/1, 1962		Wisner, Pilger, Beemer		N/A			Broken ice jam at Pilger flooded Wisner. Mile wide from Wisner to Beemer
Elkhorn	3/25-4/1, 1962		Scribner		N/A			10 fam evac in a 3-block flooded area, city park flooded
Elkhorn	3/25-4/1, 1962		Beemer, King Lake		N/A			Beemer: 75 fam evac, King Lake: National Guard evacuated half of the 620 residents
Elkhorn	Feb. 11, 1966		Norfolk		N/A		200 cattle	15 families evacuated - combination snowmelt/ice jam
Elkhorn	Feb. 11, 1966		Wisner		N/A			9 families evacuated - combination snowmelt/ice jam
Elkhorn	5/26-6/16, 1967	228	Battle Creek		Unknown			Suffered damages - no further information available
Elkhorn	5/26-6/16, 1967	228	Norfolk	$1,500,000	Unknown			8.48'/16,900cfs/16-yr flood; Damage to industrial area - SW side-near Corporation Gulch
Elkhorn	5/26-6/16, 1967	228	West Point, King Lake		Unknown			West Point: 2.5' over FS, King Lake: bad flooding
Elkhorn	5/26-6/16, 1967	228	Hooper		Unknown			Heavy rainfall caused 39,600 cfs discharge
Elkhorn	March 25, 1969		Norfolk		N/A			Crest of 8.0' (FS=6.5')
Elkhorn	February 20, 1970		Winslow		N/A			Ice jam and snowmelt on Logan Creek and Elkhorn - no other information
Elkhorn	February 20, 1970		Crowell		N/A			10 families evacuated, entire community flooded
Elkhorn	February 22, 1970		Waterloo		N/A			Rawhide Creek and Elkhorn flooding, crest of 17.7', Kings Lake area evacuated
Elkhorn	February 22, 1970		Nickerson		N/A			Worst flooding since 1944
Elkhorn	February, 1971	303	Hooper		Unknown			Ice jam and snowmelt caused 41,700 cfs (24,500=channel capacity at Hooper)
Elkhorn	March 16-20, 1978	552	Norfolk		Unknown			Peak stage of 7.0' (FS=6.5'). Ice jam affected discharge gage readings.
Elkhorn	March 18, 1978	552	West Point		Unknown			
Elkhorn	March 21, 1978	552	Waterloo		Unknown			Peak stage of 15.36' (FS=15'); 38,500 cfs.
Elkhorn	June 18, 1984	716	Waterloo		Unknown			43,100 cfs
Elkhorn	June 18, 1990	873	King Lake		$49,828,934.00 (1990 dollars)			Floodwater 1-2 feet deep forced evacuation of 150 people
Elkhorn	June 18, 1990	873	West Point		$49,828,934.00 (1990 dollars)	1		Highest flooding since 1944
Elkhorn	June, 2010	1924	Elkhorn River Corridor	$20,400,000	$52,238,044.45 (2010 dollars)			Rainfall of at least 3 to 5 inches fell over much of the upper Elkhorn River basin in mid-June. West Point received nearly 11 inches of rain in one week. This cause record or near record flooding along the Elkhorn River from Clearwater and Neligh downstream to the Elkhorn's confluence with the Platte River. The Elkhorn River near West Point crested close to 15.4 feet and remained above flood stage for over ten days. Flood damages amounted to at least 20 million dollars to public property. Damages to roads and culverts in Cumming, Washington and Dodge Counties were estimated to be at least $400,000. A federal disaster was declared for 53 counties in Nebraska for June flooding.
North Fork Elkhorn	May 29, 1888		Norfolk		N/A			70-foot breach in levee flooded up to Main St., boated in city gutters, home and RR damages reported
North Fork Elkhorn	3/27-4/1, 1912		Norfolk	$125,000	N/A			8-10" above record, flooded basements, evacuations, residents marked flood at Norfolk Ave. & 4th St.
North Fork Elkhorn	June, 1944		Norfolk	> $4,000,000	N/A			2.5-foot 'wall of water' broke out and floated Kings dance pavillion downstream, 4 feet of water covered more than 175 city blocks and damaged 180 businesses and 460 private homes
North Fork Elkhorn	July 31, 1958		Pierce		N/A			Flooded part of town, Hwy 98E closed, Hwy 13S closed
North Fork Elkhorn	April 2, 1960	98	Pierce		Unknown			2.5' over FS, 85% of town evacuated
North Fork Elkhorn	April 2, 1960	98	Norfolk		Unknown			North side of Norfolk flooded
North Fork Elkhorn	April 2, 1960	98	Plainview, Hadar, Osmond		Unknown			No further information available

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
North Fork Elkhorn	3/26-4/1, 1962		Pierce		N/A			14.9' crest, half of town evac - water 6" to 5' deep
North Fork Elkhorn	3/26-4/1, 1962		Norfolk		N/A			100 res/bus flooded; 2-3' in bus. dist. Not high as '44 but more damage than 1960 - persuaded city that flood control was needed
North Fork Elkhorn	June 20, 1967	228	Pierce		Unknown			14.5' at 3500 cfs, 5" rain, some evacs. Logan Creek also flooding
North Fork Elkhorn	March 25, 1969		Pierce		N/A			Crest of 15' (FS=12')
Elm Creek	1935		Overton		N/A			20.22' crest
Elm Creek	June 22, 1947		Overton		N/A			19.65'/8000 cfs
Fox Creek	May 17-19, 1959		Curtis		N/A			12.85'/2080 cfs - about the 25-year flood. Tributaries flooding, reading taken north of Curtis
Frazier Creek	July 5, 1956		Maywood		N/A			27.30'/11,200 cfs (from datum then in use)
Frenchman	May 31, 1935				N/A			No further information available
Frenchman	June, 1940				N/A			No further information available
Frenchman	June 19, 1951		Palisade		N/A			4-5" of rain inundated 6 blocks
Frenchman	June 17/18, 1956		Imperial, Hamlet, Palisade		N/A			4-5" rain in 1.5 hours
Frenchman	June 17/18, 1956		Wauneta	$250,000	N/A			4.58" rain;Water 4' deep in town,20" downtown."Almost completely flooded"
Frenchman	March 21, 1960	98	Palisade, Culbertson,Champion		Unknown			Ice jam above Champion put River 2' over flood stage from Culbertson to Palisade. Enders Dam overflowed, destroying bridges and inundating schools.
Hooper Creek	May 9, 1950		Palmyra		N/A			23.0'/47,600 cfs
Indian Creek	Sept. 15, 1941		Beatrice		N/A			Homes in Glenover Subd. flooded 200 yards away from Creek. Highway 77 floorboard deep on cars.
Indian Creek	June 23, 1947		Beatrice		N/A			Creek flooding and covering roads. Town isolated because Blue River, Bear & Indian Creeks all flooding
Indian Creek	June 3, 1951		Beatrice		N/A			Creek rose 11.27' in 17.5 hours - flooded Memorial Drive and Chatauqua Park
Indian Creek	July 7, 1951		Odell		N/A			Highest level since 1941
Indian Creek	July 7, 1951		Wymore		N/A			Creek closed roads north and south of town
Indian Creek	March 28, 1960	98	Beatrice		Unknown			16.7' crest - no discharge information available
Indian Creek	Sept. 13, 1961		Beatrice		N/A			10.0' crest/820 cfs
Indian Creek	July 20, 1962		Beatrice		N/A			11.3' crest/1070 cfs
Indian Creek	June 24, 1963		Beatrice		N/A			10.7' crest/945 cfs
Indian Creek	June 29, 1965		Beatrice		N/A			12.2' crest/1800 cfs
Indian Creek	July 27, 1967	228	Beatrice		Unknown			11.8' crest/1660 cfs
Keya Paha	March 27, 1960	98	Naper		Unknown			9.82'/6890 cfs
Lincoln Creek	June 15, 1967	228	Seward		Unknown			Crest of 20' (FS=15')
Lincoln Creek	March 25, 1969		Seward		N/A			Crest of 20' (FS=15')
Lincoln Creek	June 4, 1980		Aurora		N/A			6.4" rain in 3-4 hours; 400-500 year flood
Little Salt Creek	June 13, 1984	716	Lincoln		Unknown			16.20'/7500 cfs from 3-4" of rain - 40-year flood, Salt Creek also had high flows
Little Salt Creek	July 23, 1993	998	Lincoln		$47,799,461.00 (1993 dollars)			Little Salt Creek four feet over flood stage
Lodgepole Creek	August 20, 1908		Sidney		N/A			No detailed information available
Lodgepole Creek	July 11, 1944		basinwide	$246,000	N/A			Severe flooding along entire stretch from Wyoming border to mouth - damage estimate for entire basin
Lodgepole Creek	Sept. 15, 1950		Bushnell	$116,400	N/A			Discharge of 11,500 cfs from over an inch of rain basinwide - damages mostly from Bushnell area
Lodgepole Creek	July 31, 1953		Sidney	$3,000	N/A			6 families evacuated,100 new homes inundated, water over Hwy 30
Lodgepole Creek	July 31, 1953		Potter		N/A			Potter: 6" rain
Lodgepole Creek	July 31, 1953		Kimball, Gurley	$123,000	N/A			Damage estimate for the entire basin
Lodgepole Creek	July 14, 1962		Sidney	$84,300	N/A			100 residential blocks flooded, Hwy 30 closed temporarily, over 3" rain in two days above Sidney
Lodgepole Creek	June, 1965		Sidney	$130,700	N/A			Mostly residential and commercial damage
Lodgepole Creek	June 15, 1965		Lodgepole	$9,100	N/A			4.23" rain in Sidney caused storm drains to back up, minor damage to business district, Creek bank-full
Lodgepole Creek	August 14, 1968		Lodgepole, Chappell	$200,000	N/A		$500,000	1.5-7" rain near Chappell, Lodgepole: 6-7", 5000 cfs, 6.5' stage; Damages: $200K- roads, $500K - ag.
Logan Creek	September, 1906		Pender		N/A			Caused damage to structures and contents in residences

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Logan Creek	June, 1940		Pender		N/A			10" rain in 4 hours flooded 75 homes on first floor, 25 more basements flooded
Logan Creek	June 5, 1940		Uehling		N/A			18.6'/20,000 cfs
Logan Creek	June, 1954		Pender		N/A			16 residential basements flooded, street surface damage
Logan Creek	June, 1968		Randolph		N/A			124 of city's 391 residences were located in flooded area
Logan Creek	March 25, 1969		Uehling		N/A			Crest of 21.6' (flood stage=16.0')
Logan Creek	February 20, 1970		Pender, Wakefield		N/A			200-300 people evacuated in Pender from ice jam/snowmelt
Logan Creek	February 19, 1971	303	Pender		Unknown			23.11'/36,900 cfs - 50 residences flooded on 1st floor, 160 more had damage, 15 busineses dam
Logan Creek	February 20, 1971	303	Uehling		Unknown			20.15'/25,200 cfs
Lost Creek	March 29, 1960	98	Columbus		Unknown			50 families evacuated on north side of town, 10 blocks flooded
Lost Creek	April 1, 1962		Columbus		N/A			Lost Creek backed up by full Platte, flooded streets and basements
Loup	June 6, 1896		Columbus		N/A			70,000 cfs was discharged into Platte for 7 hours after 12" rain in places
Loup	June 6, 1896		Palmer		N/A			the Loup River was at a high-flood stage for the first time in Palmer's History. It flooded the low lands and swept away the bridge north of Palmer.
Loup	April 26, 1935		Columbus		N/A			7" rain caused 41,500 cfs and 9.5' stage height; water 18" in SW part of town
Loup	June 23, 1947		Columbus	$388,000	N/A			12.0'/85,000 cfs - 112 blocks/500 homes flooded; 900 families evacuated
Loup	June 23, 1947		Genoa		N/A			90,000 cfs at 10.12' gage height
Loup	June 23, 1947		Ravenna		N/A			No further information available
Loup	June 23, 1947		Palmer		N/A			Took away the approach of the bridge and changed the channel so much that the bridge had to be lengthened by 180 more feet
Loup	February, 1948		Columbus	$72,000	N/A			2 ice jams in month. In first jam, buildings were damaged and 2 fam evac
Loup	July 10, 1950		Columbus		N/A			42,100 cfs
Loup	March 28, 1960	98	Genoa		Unknown			11.7'/45,000 cfs
Loup	3/30-4/4, 1960	98	Columbus	$236,000	Unknown	1		10.5'/52,000 cfs; 75 families evacuated, 1 home destroyed, 14 homes with over 2' on first floor
Loup	March 26, 1962		Fullerton		N/A			Loup River 3 miles wide
Loup	February 9, 1966		Monroe		N/A			Ice jam closed Loup River bridge and half-mile of highway - 1.4" rain and some melting
Loup	Aug. 12-15, 1966	221	Platte, Boone, Nance Co. PDD		Unknown		$500,000 - LPPDest.	Damages:$123,000 business, rest residential. 24 bus/634 res flooded. 100-year storm event
Loup	Aug. 12-15, 1966	221	Columbus	$9,300,000	Unknown			119,000 cfs/13.1' gage height, 1000 fam evac; Wagners Lake and Stire's Lake hit hard; 30-40 fam evac from S part of town; 2 homes dest.,
					N/A			25 with major dam, 1/3 of town affected; Loup 2.5 to 4 miles wide, 634 homes/34 businesses-severely damaged; 38,000 acres flooded in eastern subbasin
Loup	Aug. 12-15, 1966	221	Genoa	"In the millions"	Unknown		many cattle lost	13.93'/129,000 cfs - (3.2' higher than 1947 record); 30 people rescued from trees
Loup	Aug. 12-15, 1966	221	Fullerton		Unknown			Water supply line over Cedar River ruptured, water/sewer lines severely damaged
Loup	Aug. 12-15, 1966	221	Cedar Rapids, Scotia, Albion		Unknown			Damage occurred - no further information available
Loup	June 24-26, 1968		Columbus		N/A			7.6' crest, 32,000 cfs
Loup	March 20, 1969		Columbus		N/A			50-75 people evacuated from SW part of city, Columbus Manor isolated
Loup	March 25, 1969		Columbus		N/A			12.5' crest (9.0' FS)
Loup	June 13, 1984	716	Genoa		Unknown			10.62'/44,700 cfs - 15-year flood
Loup	March 9, 1993	983	Columbus	$2,000,000	$7,790,523.00 (1993 dollars)			Ice jam at Hwy 81 bridge, Buildings along Hwy 30/81 flooded, some fam evacs
Middle Loup	June 23, 1947		St. Paul		N/A			12.67'/72,000 cfs - flood of record
Middle Loup	March 17, 1978	552	St. Paul		Unknown			Peak stage of 9.3' (FS=8.0'). Ice jam below gage affected discharge readings
Middle Loup	June 12, 1984	716	St. Paul		Unknown			29,100 cfs - second highest flow of record, 25-year flood
North Loup	June 6, 1896		St. Paul		N/A			90,000 cfs from 12" of rain in places
North Loup	June 18, 1954		St. Paul		N/A			4.25" rain left 18 inches of water on downtown streets
North Loup	August 12, 1966	221	St. Paul		Unknown		cattle, road dam	35,000 cfs
North Loup	Aug. 12-15, 1966	221	Greeley County		Unknown			15" rain in 8 hours maximum rainfall rate during period
North Loup	March 25, 1969		St. Paul		N/A			7.5' crest, 2' over flood stage
North Loup	March 20, 1978	552	St. Paul		Unknown			Peak stage of 7.42' (FS=5.5'). Ice jam below gage affected discharge readings
South Loup	June 22, 1947		St. Michael		N/A			12.0'/50,000 cfs

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
South Loup	March 16, 1978	552	St. Michael		Unknown			Ice jam. Peak stage of 13.05' (FS=6.5')
Maple Creek	1944		Howells		N/A			No detailed information available
Maple Creek	June 11, 1944		Nickerson		N/A			16.28'/35,000 cfs - greatest flood to date
Maple Creek	1947		Howells		N/A			No detailed information available
Maple Creek	June 16, 1984	716	Howells		Unknown			4-5" rain overtopped levee in 4 locations, flooded city 2-3' in bus dist and area
Maple Creek	June 4, 1991	908	Howells		$4,191,578.00 (1991 dollars)			4-7" rain caused overtopping of 15' dike, damaged businesses and homes, 80% of town affected
Medicine Creek	June 22, 1947		Cambridge	$15,000,000	N/A	13		250 homes damaged, "wall of water 8' high", damage to railroad, roads, and bridges very bad
Mill Creek	1923		Louisville		N/A			4' of floodwater on Main Street
Missouri	February 19, 1905		Omaha		N/A			Flood moved a portion of River east, leaving a small part of Iowa on the NE side - was known as Lake Nakoma or "Cut Off Lake", later changed to Carter Lake in 1906.
Missouri	March 27, 1881		Cedar County, Green Island	"Millions"	N/A	3	1000's of livestock	Ice jam 4' thick. Release swept away towns. 41' elev. at Vermillion, SD
Missouri	April 6, 1881		Omaha		N/A			River 5 miles wide, ran yellow w/ clay and corn debris, Crest on 4/7 was 23.8' (2' above record), people stood on roofs on 9th St.; High water continued for several weeks. Record crest was 24.6'.
Missouri	April 25, 1881		Omaha		N/A			24.65' maximum stage caused by an ice jam
Missouri	April 26, 1881		Rulo		N/A			22.9' crest - no discharge determined
Missouri	May, 1903				N/A			No further information available
Missouri	June, 1929		Omaha, Fort Calhoun		N/A			Fort Calhoun: 198,000 cfs
Missouri	June 19, 1932		Fort Calhoun		N/A			137,000 cfs
Missouri	April 5, 1939		Fort Calhoun		N/A			141,000 cfs
Missouri	April 1-13, 1943		South Sioux City		N/A			Crest of 18.7' (record is 22.5' which completely inundated town)
Missouri	April 1-13, 1943		Decatur, Blair		N/A			River 15 miles wide - from Decatur to Onawa, Iowa
Missouri	April 1-13, 1943		Tekamah		N/A			Filled then-dry Lake Quinnebaugh
Missouri	April 1-13, 1943		Omaha, Florence	$1,400,000	N/A	1		Crest = 22.45' at 200,000 cfs; 3000 lost flood fight, flooded 100 homes, breached new dike at Locust St., slowly filled Lake Florence bed, flooded airport to 7' in 18 hours. Industrial section (Grace St.) flooded, businesses closed several days, dikes at Peru failed.
Missouri	April 12, 1944		Fort Calhoun		N/A			200,000 cfs
Missouri	June 14, 1944		Nebraska City		N/A			214,000 cfs - record discharge before 1952 flood
Missouri	June 5, 1947		Plattsmouth		N/A			6.7" of rain. 5.5 feet of water on streets.
Missouri	6/25 - 7/1, 1947		Omaha		N/A			New record crest at Omaha
Missouri	6/25 - 7/1, 1947		Fort Calhoun		N/A			150,000 cfs
Missouri	April 13, 1949		Fort Calhoun		N/A			183,000 cfs
Missouri	March 6, 1949		Nebraska City		N/A			Record gage height of 25.8'; caused by ice jam
Missouri	April 25-30, 1950		South Sioux City		N/A			Dike breached in 4 places, 100 families evacuated
Missouri	April 25-30, 1950		Fort Calhoun		N/A			196,000 cfs
Missouri	April 25-30, 1950		Omaha		N/A			City safe behind new $6M floodwall. Crest expected to equal 1943 flood
Missouri	April 25-30, 1950		Rulo		N/A			Record disharge and stage - 185,000 at 21.60'
Missouri	May 9-10, 1950		Rulo		N/A			172,000 cfs at 21.55'
Missouri	May 9-10, 1950		Nebraska City		N/A			147,000 cfs at 18.60'
Missouri	March 30, 1951		Rulo		N/A			Crest = 19.06'
Missouri	March 30, 1951		Nebraska City		N/A			16.0' crest
Missouri	April 14, 1952		Sioux City, IA		N/A			24.28'/441,000 cfs
Missouri	April 7-19, 1952		South Sioux City	$2,500,000	N/A			All residents (5,557) urged to evacuate. Every home had water. Crest on 4/14 was 24.38' (FS=19.0'). 4/13 one-third of town under 8' of water
Missouri	April 7-19, 1952		Dakota City		N/A			Evacuated all 622 people
Missouri	April 7-19, 1952		Niobrara		N/A			75 homes affected
Missouri	April 7-19, 1952		Homer, La Platte		N/A			Towns either hit hard or virtually abandoned
Missouri	April 7-19, 1952		Blair		N/A			Record crest of 23.15' reached 4/18 (FS=18.0')
Missouri	April 7-19, 1952		Fort Calhoun		N/A			396,000 cfs

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Missouri	April 7-19, 1952		Omaha		N/A			"Highest flood known to white man"; record: 40.2' at 396,000 cfs (FS=29.0'). 40,000's of people evac'd - Carter Lake and East Omaha, many other places
Missouri	April 7-19, 1952		Plattsmouth		N/A			Missouri flowing at 400,000 cfs
Missouri	April 7-19, 1952		Bellevue		N/A			20 families rescued
Missouri	April 7-19, 1952		Nebraska City		N/A			27.66'/414,000 cfs, 500+ year flood
Missouri	April 7-19, 1952		Rulo		N/A			25.60'/358,000 cfs
Missouri	March 31, 1960	98	Rulo, Bellevue		Unknown			Bellevue: 3 fam evac; Rulo: 22.36'/181,000 cfs - 5' over FS
Missouri	April 1, 1962		Bellevue		N/A			400 fam evac from bottomland areas, high Missouri caused Platte backup
Missouri	June 18, 1967	228	Nebraska City		Unknown			Industrial area/docks flooded. 23' crest (18' FS), worst flood since 1952
Missouri	March 21, 1978	552	Plattsmouth		Unknown			Peak stage of 21.9' (FS=16'). No discharge reading available.
Missouri	March 22, 1978	552	Nebraska City		Unknown			Peak stage of 22.39' (FS=18'); 155,000 cfs.
Missouri	March 23, 1978	552	Rulo		Unknown			Peak stage of 22.01' (FS=17'); 163,300 cfs.
Missouri	June 15, 1984	716	LaPlatte, Plattsmouth		Unknown			LaPlatte: 200 residents evacuated homes for 2 weeks, Plattsmouth: businesses and cabins flooded
Missouri	June 15, 1984	716	Nebraska City		Unknown			24.78'/182,000 cfs - 25-year flood
Missouri	June 16, 1984	716	Rulo		Unknown			24.40'/242,000 cfs - 100-year flood, many local levees were breached and homes and cabins flooded
Missouri	June 25, 1984	716	Sioux City, IA		Unknown			30.91'/104,000 cfs - 50-year flood. Higher stage but lower discharge than 1952 flood (Gavins Dam)
Missouri	June 27, 1984	716	Omaha		Unknown			29.02'/116,000 cfs - substantially less recurrence interval than Sioux City, IA
Missouri	June 18, 1990	873	Sarpy County		$49,828,934.00 (1990 dollars)			15-30 homes had floodwater 2-4 feet deep at Iske Park and Holubs Place
Missouri	July 23, 1993	998	Brownville		$47,799,461.00 (1993 dollars)			Record crest of 44.3' - 12' over flood stage. Brownville's water system inundated, Levee L-550 breached
Missouri	July 23, 1993	998	Peru		$47,799,461.00 (1993 dollars)			Five families were evacuated to Red Cross shelters
Missouri	June, 2010	1924	Omaha to Rulo	$20,000,000	$52,238,044.45 (2010 dollars)			Many locations from central into northeast Nebraska received 3 to 4 inches or more rainfall in the 72 hours ending the morning of the 12th resulting in flooding on the Missouri River, among others, extending from Omaha to Rulo. In Plattsmouth the Missouri River crested a little over 33 feet, flood stage is 26 feet. Flood damage over Nebraska in mid to late June amounted to at least 20 million dollars to public property. A federal disaster was declared for 53 counties in Nebraska for June flooding.
Missouri	June - August, 2011	4013	Missouri River Corridor	$44,500,000	$81,345,790.12 (2011 dollars)			A record rain event in May in eastern Montana, other storms in April and May, and snow melt all combined to bring record high water to the Missouri River chain of reservoirs. Releases from Gavins Point Dam increased to around 160,000 cfs by mid-June and remained around that level through July. The high releases produced moderate to major flooding along the Missouri River which gradually worsened from May into June and then continued through July and into August. OPPD reported that costs associated with the flooding totaled 44.5 million dollars as of August 11th. As of early July a total of 134 Nebraska homes and private buildings had been destroyed by flood waters of the Missouri while an additional 142 had sustained major damage.
Mud Creek	May 27, 1945		Broken Bow		N/A			7200 cfs - 100-year flood, 4" rain covered 60 blocks 20" deep; 25 homes and 72 businesses damaged
Mud Creek	June 22, 1947		Broken Bow		N/A			3700 cfs - 2.7" of rain in town covered 38 blocks - 35 residences and 45 businesses damaged
Mud Creek	June 22, 1947		Sweetwater		N/A			23.20'/27,000 cfs
South Branch Mud Creek	June 17, 1956		Broken Bow		N/A			16.41'/1790 cfs
Mud Creek	March 25, 1962		Broken Bow		N/A			1.6" rain and snowmelt flooded part of downtown
Muddy Creek	June 22, 1947		Arapahoe		N/A			31-foot crest taken from floodmarks - no discharge information available
Muddy Creek	June 17, 1954		Verdon		N/A			22.97'/17,100 cfs
Muddy Creek	July 10, 1958		Verdon		N/A			31.5'/31,900 cfs
Muddy Creek	March 27, 1960	98	Verdon		Unknown			23.9'/20,000 cfs - 12-year flood
Big Nemaha	Feb. 20, 1949		Falls City, Preston, Rulo		N/A			12+ families evac; 15,500 acres flooded; 26' height (FS=21.5')

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Big Nemaha	June 2, 1949		Falls City		N/A			34,200 cfs at 28.8' gage height
Big Nemaha	May 9, 1950		Falls City	$1,068,400	N/A			26,300 cfs at 26.0' gage height; 20,000 acres flooded, affected 5 towns
Big Nemaha	August 22, 1952		Falls City, Preston		N/A			Crested at 23'. 1.5' deep on Hwy 4. 4.88" at Tecumseh, 4.3" at Stella
Big Nemaha	June 17, 1954		Humboldt, Rulo, Dawson		N/A		$217,000	Humboldt: 28.48'/43,300 cfs from 5.5" rain; damage est. for ag and bridges from Dawson to Rulo
Big Nemaha	June 18, 1954		Falls City, Steinauer		N/A			Steinauer: 7" rain, Falls City: 27.68' (FS=21.5') - discharge 51,400 cfs (?)
Big Nemaha	Sept. 5, 1958		Falls City		N/A			Nemaha River 6' over flood stage
Big Nemaha	Sept. 5, 1958		DuBois		N/A			12.10" rain
Big Nemaha	July 12, 1992	954	Falls City		$1,788,512.00 (1992 dollars)			Lowlands flooded from Falls City to mouth, cropland and many roads affected
Big Nemaha	July 24, 1992	954	Falls City		$1,788,512.00 (1992 dollars)			River 5-6' out of its banks, flooding lowlands to the mouth, closed highway
Big Nemaha	July 29, 1992	954	Falls City, Rulo		$1,788,512.00 (1992 dollars)			9th highest stage recorded, State highway closed for 2 days, entire Lower Big Nemaha 7-8' over banks
Big Nemaha	July 24, 1993	998	Falls City		$47,799,461.00 (1993 dollars)			Intense rainfall caused Big Nemaha to take a sharp rise to over 7.8 feet above flood stage
North Fork Big Nemaha	June, 1941		Tecumseh		N/A			Water upto 8' deep in some parts of city
North Fork Big Nemaha	July 10, 1958		Humboldt		N/A			31.7'/51,000 cfs
North Fork Big Nemaha	March 28, 1960	98	Humboldt		Unknown			24.2'/36,200 cfs - over the 25-year flood
					N/A			
North Fork Little Nemaha	May 8, 1950		Dunbar		N/A	2		2 lives lost when 7 homes, dance hall, filling station washed away. The depot, many homes and several Main Street businesses received heavy damage
					N/A			
Little Nemaha	Spring 1883		Brock		N/A			One of two floods that year that caused the post office and many businesses to move to the hill which they called "South Brock"
Little Nemaha	May 9, 1950		Syracuse		N/A			36.7'/225,000 cfs - 5X bigger than 1935 Rep. R. flood (?), 4X bigger than 1947 Medicine Creek flood (?)
Little Nemaha	May 9, 1950		Auburn		N/A	4		New record 27.65' at 164,000 cfs
Little Nemaha	May 9, 1950		Talmage		N/A			192,000 cfs - 1.5' over 100-year flood, RR bridge severely damaged
Little Nemaha	June/July, 1950		see Salt Creek		N/A			
Little Nemaha	May 9, 1950		Unadilla		N/A	7		Water 10' deep, farms & bridges destroyed, deaths caused as bus swept away
Little Nemaha	May 9, 1950		Syracuse		N/A			36.7'/225,000 cfs (est.). Homes moved off foundations, river 1+ miles wide
Little Nemaha	May 9, 1950		Brock		N/A			Entire village inundated - damage to bridges, highways, farm property, and railroads all heavy
Little Nemaha	June 2, 1951		Syracuse		N/A			20 families evacuated
Little Nemaha	June 2, 1951		Auburn		N/A			24.85' crest with 49,000 cfs
Little Nemaha	July 7, 1951		Auburn		N/A			6.44" rain in Auburn
Little Nemaha	July 7, 1951		Nemaha		N/A			Water over the roads at Nemaha
Little Nemaha	July 15, 1952		Auburn		N/A			27.0' crest (FS=22.0')
Little Nemaha	June 17, 1954		Falls City		N/A			27.44'/51,400 cfs - most damage done to crops
Little Nemaha	March 27, 1960	98	Auburn		Unknown			24.2'/48,000 cfs
Little Nemaha	June 25, 1963		Unadilla		N/A			Town had heavy flooding - no other information available
Little Nemaha	July 24, 1992	954	Auburn		$1,788,512.00 (1992 dollars)			1-3" rain fell and caused the highest river level since 1979
New York Creek	June 11, 1944		Herman		N/A			20.8'/4700 cfs
New York Creek	July 15, 1950		Herman		N/A			19.5'/5500 cfs
New York Creek	June 21, 1957		Spiker		N/A			23.40'/3160 cfs
Niobrara	April 29, 1881		Niobrara	$200,000	N/A			6' of water in streets, residents moved everything to second floors
Niobrara	July, 1903				N/A			No further information available
Niobrara	Sept., 1934				N/A			No further information available
Niobrara	June 14, 1943		Spencer		N/A			21,500 cfs, no height data
Niobrara	June, 1948				N/A			No further information available
Niobrara	March 12, 1955		Spencer		N/A			12.16'/27,400 cfs
Niobrara	March 27, 1960	98	Verdel		Unknown			Record 39,000 cfs discharge due to an ice jam break, gage height of 10.1'

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Niobrara	March 27, 1960	98	Spencer		Unknown			8.6'/23,400 cfs
Oak Creek	1898		Dannebrog		N/A			Worst flood of record - no information available
Oak Creek	1936		Dannebrog		N/A			Third worst flood of record
Oak Creek	June 15, 1945		Valparaiso		N/A			5 residential and 5 business basement flooding, 2 residences with 1st-floor flooding
Oak Creek	June 15, 1945		Raymond		N/A			3 residential basements flooded
Oak Creek	June 15, 1945		Valparaiso, Raymond, Lincoln	$146,440	N/A			$7,400 of damage estimate occurred to urban areas
Oak Creek	July 9, 1950		Dannebrog		N/A			17.00'/1780 cfs
Oak Creek	June 17, 1954		Dannebrog		N/A			17.23'/1880 cfs
Oak Creek	June 25, 1963		Raymond		N/A			Town flooded, some evacuations. "Worst flooding since 1908", 100-year flood
Oak Creek	June 25, 1963		Lincoln		N/A	1		Dead Man's Run washing out bridges; Antelope Cr. Dam stopping damages
Oak Creek	June 25, 1963		Valparaiso		N/A	3		2 feet of water in downtown from North Oak Creek
Oak Creek	1967	228	Dannebrog		Unknown			Second worst flood of record in Dannebrog
Oak Creek	June 12, 1984	716	Dannebrog		Unknown			9" rain in 12 hours flooded 36 residences, 12 businesses, and City Hall
Omaha Creek	May 31, 1922		Homer		N/A			Flood depth of about 8 feet
Omaha Creek	June 4, 1940		Homer		N/A			Discharge of 51,000 cfs over 500-year level; depth reports worse than 1922 flood - height estimated at 32.5'
South Omaha Creek	June 21, 1954		Walthill, Winnebago		N/A			18.71'/10,100 cfs200-300 cars stalled on Hwy 77; 43 fam evac in Walthill, 14 in Winnebago
South Omaha Creek	June 13, 1957		Walthill		N/A			24.92'/14,200 cfs
Omaha Creek	June, 1967	228	Homer		Unknown			15.3' at 6,800 cfs
Omaha Creek	February 25, 1971	303	Homer		Unknown			Storm sewer back-up flooded city streets, 15-20 families close to the Creek evacuated after the Village issued a warning
Owl Creek	May 9, 1950		Syracuse		N/A			30.6'/16,000 cfs
Big Papillion Creek	May 20, 1903		Papillion		N/A			From old photos, appears to be more nuisance flooding from mud deposits and boardwalk damage, but one structure was moved from its foundation near 2nd & Washington (now 84th St.), also impacted Fort Crook
Big Papillion Creek	1929				N/A			No information available
Big Papillion Creek	August 12, 1932				N/A			No information available - impacted Fort Crook
Big Papillion Creek	1936				N/A			No information available
Big Papillion Creek	1941				N/A			No information available
Big Papillion Creek	1943				N/A			No information available
Big Papillion Creek	1948				N/A			No information available
Big Papillion Creek	1950				N/A			No information available
Big Papillion Creek	April 4, 1955		West Omaha		N/A			2.2" in 30 min. put water over basement window sills in NW Omaha, daytime sky dark as night
Big Papillion Creek	August 3, 1959		Irvington		N/A			Irvington: 3' over flood stage
Big Papillion Creek	August 3, 1959		Fort Crook		N/A			6' over flood stage at Ft. Crook
Big Papillion Creek	August 3, 1959		Papillion		N/A			Highest level in 41 years; 6 families evacuated, many basements flooded. Picture available of sandbagged Papio Theater on Washington St across from Papillion City Park
Big Papillion Creek	June 21, 1960		Irvington		N/A			6 families evacuated, Creek 1/4-mile wide
Big Papillion Creek	June 21, 1960		Fort Crook		N/A			7' over flood stage, part of town flooded, many evacuated
Big Papillion Creek	June 16/17, 1964		Millard	$4,962,000	N/A	7		95 trailers dest; damages do not include personal loss; 45,900 cfs
Big Papillion Creek	June 16/17, 1964		Papillion		N/A			5.2" rain
Big Papillion Creek	June 16/17, 1964		Ralston		N/A			Heavy business damage, Creek upto 5 feet deep in city
Big Papillion Creek	June 16/17, 1964		Bennington		N/A			No information available
Big Papillion Creek	Sept. 6/7, 1965		Omaha		N/A			31,200 cfs on Creek after 7.88" rain in 9 hours
Big Papillion Creek	July 23, 1993	998	Bellevue		$47,799,461.00 (1993 dollars)			Creek was 2' over flood stage
Little Papillion Creek	June 21, 1960		Omaha		N/A			15,300 cfs at Irvington St. and 10,000 cfs at Cass St.
Little Papillion Creek	June 16/17, 1964		Omaha		N/A			8,500 cfs at mouth
Little Papillion Creek	Sept. 6/7, 1965		Omaha		N/A			12,800 cfs at mouth
West Papillion Creek	1948		Papillion		N/A			59-year flood at 25,500 cfs
West Papillion Creek	1959		Papillion		N/A			35-year flood at 22,500 cfs

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
West Papillion Creek	June 16/17, 1964		Elkhorn		N/A			Water was reported to have been two feet over the railroad tracks and three feet deep at the intersections of Blondo Street and Main Street
West Papillion Creek	June 16/17, 1964		Papillion		N/A			40,800 cfs at Giles Rd. - estimated 100-year flood; 31,500 cfs at mouth
West Papillion Creek	Sept. 6/7, 1965		Papillion		N/A			17,500 cfs at mouth
Mud Creek	1967	228			Unknown	1		25-year flood recurrence interval, Betz Road Ditch also flooding
Mud Creek	1971				N/A			No further information available
Hell Creek	June 16, 1964		Omaha		N/A			500-year flood caused by 8" rain in 3 hours, Creek 50' wide w/ 5' waves
Hell Creek	June 16, 1964		Papillion		N/A			8' water, water 6' deep at 180th and Center
Hell Creek	Sept. 6/7, 1965				N/A			1964 flood event nearly equaled - no detailed information
Pebble Creek	June 28, 1953		Dunlap		N/A			12.88'/2740 cfs
Pebble Creek	June 16, 1984	716	Scribner		Unknown			23.75'/20,300 cfs - height reading inaccurate because high flow by-passed the gage
Pebble Creek	June 18, 1990	873	Scribner		$49,828,934.00 (1990 dollars)			Record crest
Pebble Creek	June 4, 1991	908	Scribner		$4,191,578.00 (1991 dollars)			6" rainfall caused highest recorded discharge of 27,900 cfs caused a crest of 24.15'
Platte	1881		Valley		N/A			No further information available
Platte	1882		Louisville		N/A			No further information available
Platte	1883		Kearney, Ashland		N/A			Only refered to as the "Great Flood of 1883"
Platte	June 7, 1894		Kearney		N/A			Bottomlands evacuated, "Long Bridge" wagon train wiped out by 3' and 2' successive walls of water
Platte	June 12, 1897		Duncan		N/A			24,400 cfs
Platte	June 2, 1898		Duncan		N/A			24,700 cfs
Platte	May 7, 1900		Duncan		N/A			29,200 cfs
Platte	1903		Valley		N/A			No further information available
Platte	June 23, 1905		Duncan		N/A			6.5'/44,100 cfs (different gage from current one)
Platte	June 8, 1908		Duncan		N/A			34,200 cfs
Platte	March 29, 1912		Valley		N/A			Ice jam N of town. Water 3-4' deep in SW part of town, RR tracks washed out.
Platte	Feb. 19, 1930		Ashland		N/A			39,800 cfs
Platte	Feb. 28, 1932		Ashland		N/A			58,000 cfs
Platte	June 6, 1935		Grand Island		N/A			5.99'/30,000 cfs - both records
Platte	June 7, 1935		Duncan		N/A			30,000 cfs
Platte	March 5, 1936		Valley, Ashland		N/A			Ice jam. Ashland: 8.33'/48,000 cfs
Platte	March 6, 1937		Ashland		N/A			24,500 cfs
Platte	June 12, 1944		Ashland		N/A			Record discharge of 107,000 cfs after dikes broken; greatest flood on Platte in Ashland since 1883
Platte	June 23, 1947		Gothenburg, Grand Island, Odessa		N/A			Brady Island to Maxwell "a solid sheet of water", 20,300 cfs at Grand Island
Platte	June 23, 1947		Monroe, Fremont, Rulo		N/A			Water over Hwy. 77 at Fremont, Big Island isolated
Platte	June 23, 1947		North Bend		N/A			90,000 cfs record
Platte	2/28-3/5, 1948		Valley, Mercer, Fremont		N/A			Breach in Union Dike flooded Mercer, flooded RR, Hwy 275, and town in Valley
Platte	March 1, 1948		Ashland		N/A			58,500 cfs
Platte	March 4, 1949		Grand Island		N/A			6.03' stage record caused by ice jam
Platte	March 8, 1949		Ashland		N/A			46,000 cfs
Platte	March 13, 1952		Ashland		N/A			4.28'/31,800 cfs
Platte	March 28, 1960	98	Duncan		Unknown			25,400 cfs
Platte	3/28-4/2, 1960	98	North Bend		Unknown	3		10.04'/112,000 cfs. Entire town had 4' water, 20 businesses and 56 homes flooded, 83-year flood
Platte	3/28-4/2, 1960	98	Fremont, Ames, Wann, Linwood		Unknown			Fremont: 1400 people urged to evac between river and Union Pac. RR;
Platte	3/28-4/2, 1960	98	Valley, Cedar Creek		Unknown	1		Valley: ice jam breached Union Dike; 400 evacuated; 112,000 cfs, 60-year flood
Platte	3/28-4/2, 1960	98	South Bend, Plattsmouth		Unknown			South Bend: 124,000 cfs, 40-year flood; North Bend: 112,000 cfs
Platte	3/28-4/2, 1960	98	Cowles Lake, Steele City		Unknown			CL: All 7 residents evac; SC: 29 families evac (1/3 of town)
Platte	3/28-4/2, 1960	98	Ashland		Unknown			National Guard camp evac for first time ever; Wahoo/Salt Creeks flooding
Platte	3/28-4/2, 1960	98	Waterloo		Unknown			Town totally evac, water 5-6' deep, flowed over main st. north of RR tracks

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Platte	3/28-4/2, 1960	98	Louisville		Unknown			Crest of 12.45' (FS=10'); 124,000 cfs largest since 1882; 12 families evacuated
Platte	March 25, 1962		Columbus		N/A			Ice jam caused 40-50 blocks to be flooded, water running in streets
Platte	March 25, 1962		North Bend		N/A			4-year flood recurrence interval
Platte	March 25, 1962		Valley, Fremont		N/A			Ice jam breached Union Dike, 90% of town flooded
Platte	March 25, 1962		Fremont		N/A			Fremont: Big Island urged to evacuate
Platte	February 11, 1966		Interstate 80		N/A			Rain and release of ice jam on Elkhorn took out a portion of the I-80 bridge for a week, broke a dike near confluence of Platte and Elkhorn
Platte	5/26-6/16, 1967	228	Mitchell		Unknown			12.78" rain for period near the annual average
Platte	5/26-6/16, 1967	228	Duncan		Unknown			6.36'/30,000 cfs
Platte	5/26-6/16, 1967	228	Grand Island		Unknown			1800 buildings damaged - (See Wood River) Wood River, Silver Creek, Prairie Creek all flooding
Platte	5/26-6/16, 1967	228	South Bend		Unknown			12.4'/117,000 cfs
Platte	5/26-6/16, 1967	228	North Bend		Unknown			North Bend 7.55' at 74,300 cfs; 20-year flood
Platte	5/26-6/16, 1967	228	Fremont, Louisville		Unknown			All but highest portion of Fremont Island flooded to 1'; Louisville: 4' over FS
Platte	5/26-6/16, 1967	228	LaPlatte		Unknown			12 people evacuated for Platte/Missouri flooding
Platte	5/26-6/16, 1967	228	Schuyler, Columbus, Central City, Wood River		Unknown			General flooding reported - no detailed information available
Platte	June 24-26, 1968		Doniphan,Central City		N/A			7.5" rain near Doniphan
Platte	June 24-26, 1968		North Bend		N/A			5.48'/32,300 cfs
Platte	March 25, 1969		Grand Island, North Bend		N/A			Grand Island: .5' over flood stage; North Bend: 1.5' over flood stage
Platte	March 25, 1969		Louisville		N/A			3' over flood stage
Platte	February 22, 1970		Fremont		N/A			Big Island area evacuated
Platte	February 22, 1970		Venice		N/A			Entire Venice-Two Rivers under 5-7" water from ice jam, "one big lake"
Platte	March, 1978	552	Valley, Mercer		Unknown			Ice jam above Hwy 92 bridge overtop Union Dike, record stage but not record discharge
Platte	March 20, 1978	552	North Bend		Unknown	1		Ice jam and high flows below Hwy 79 bridge caused record stage, flooded town; 25-year flood. Stage gage washed out (FS=8'), 80,000cfs
Platte	March 20, 1978	552	Louisville		Unknown			Peak stage of 10.94' (FS=9.0'); 115,000 cfs
Platte	March, 1978	552	South Bend		Unknown			110,000 cfs
Platte	June 13, 1984	716	North Bend		Unknown			65,200 cfs
Platte	June 13, 1984	716	Louisville		Unknown			144,000 cfs the greatest discharge in 32 years of record - Salt Creek adding most of flow, also Elkhorn
Platte	June 20, 2011	4013	Sutherland and North Platte	$11,000	$81,345,790.12 (2011 dollars)			Thunderstorms containing very heavy rainfall occurred across portions of southwest Nebraska causing flash flooding over portions of western Lincoln and eastern Keith County during the evening hours on June 20th, 2011. A resident reported 6.20 inches of rainfall near Sutherland. County roads in the area were washed out and flood damages were estimated to be at least $11,000. Releases from Kinglsey Dam caused the North Platte River, at North Platte, to reach stages between 6.6 and 6.8 feet, above major flood stage, for the entire month of August.
Platte	September 21- October 02, 2013		North Platte through Grand Island, along Platte River		N/A			Historic, heavy rainfall in the Colorado Rocky Mountains fell September 9 - 15. These rains fell largely in the South Platte River basin and traveled downstream through Nebraska. Flooding occurred along the South Platte and Platte Rivers.
North Platte	June, 1899				N/A			No further information available
North Platte	June, 1909		Mitchell		N/A			27,500 cfs on North Platte
North Platte	June, 1921				N/A			No further information available
North Platte	June, 1923				N/A			No further information available
North Platte	June, 1929				N/A			No further information available
North Platte	June 27, 1952		Gering, Scottsbluff		N/A			Half-inch rainfall in 10 minutes caused minor flooding in towns
North Platte	June 27, 1955		Scottsbluff		N/A			20" rain caused 20,000 cfs (can carry 12,000). Many families in valley evac
North Platte	June, 1971	308	Mitchell, Gering, North Platte		Unknown			Mitchell: 12,200 cfs = 50-year discharge from snowmelt/runoff. NP:55-yr flood
North Platte	June, 1973		Mitchell, Minatare, Gering		N/A			Mitchell: 14,900 cfs/ 100-year flood; Minatare: 8,640 cfs/40-year discharge

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
North Platte	June 20, 2011	4013	Sutherland and North Platte	$11,000	$81,345,790.12 (2011 dollars)			Thunderstorms containing very heavy rainfall occurred across portions of southwest Nebraska causing flash flooding over portions of western Lincoln and eastern Keith County during the evening hours on June 20th, 2011. A resident reported 6.20 inches of rainfall near Sutherland. County roads in the area were washed out and flood damages were estimated to be at least $11,000. Releases from Kinglsey Dam caused the North Platte River, at North Platte, to reach stages between 6.6 and 6.8 feet, above major flood stage, for the entire month of August.
South Platte	1921		North Platte		N/A			25-year flood
South Platte	May 31, 1935		North Platte		N/A			37,100 cfs. 60-year flood
South Platte	1942		Paxton		N/A			16,900 cfs - record previous to 1965 flood
South Platte	June, 1965		Paxton		N/A			34,600 cfs was record discharge
South Platte	June, 1965		North Platte		N/A			22-year flood
South Platte	1973		North Platte		N/A			20-year flood
South Platte	September 18-20, 2013		Brule, Big Springs, Brady, Sutherland		N/A			Record stages at Roscoe and South Platte. Historic, heavy rainfall in the Colorado Rocky Mountains fell September 9 - 15. These rains fell largely in the South Platte River basin and traveled downstream through Nebraska. Flooding occurred along the South Platte.
Pigeon Creek	February 25, 1971	303	Dakota County	$10,000	Unknown			Omadi drainage ditch breached in two places - crop and minor farm damage. Pigeon drainage ditch also breached. Damage was to county roads. Some basement flooding
Pigeon Creek	July 1, 1996		Dakota County	$3,000	N/A			Estimated 9-inch rain, three structures impacted, damage figure is for out-buildings on one property, but basement flooding in others and ag damage, Hwy 35 overtopped
Plum Creek	June/July, 1950		?	$304,800	N/A			No detailed information available - most likely the Plum Creek between Albion-Fullerton and not the trib in Seward
Plum Creek	1963		Seward		N/A			20,200 cfs - over the 500-year flood event discharge
Plum Creek	June 15, 1967	228	Seward		Unknown			Creek "Highest it's ever been"; Big Blue and Lincoln Creek also flooding
					N/A			
Ponca Creek	March 27, 1960	98	Bristow, Lynch		Unknown			Dozens of families evacuated, cars stalled on highway 12
Ponca Creek	March 27, 1960	98	Anoka		Unknown			16.86'/9810 cfs
Ponca Creek	March 27, 1960	98	Verdel		Unknown			15.10'/15,700 cfs
Prairie Creek	June 14-18, 1967	228	Grand Island		Unknown			62 residences & 7 businesses flooded on N side of city, Wood River causing severe flooding on south side.
					N/A			$3.3 million estimated damage for whole city, $13 million estimated rural loss
Prairie Creek	June 25, 1968		Cairo		N/A			9.7' crest at Highway 2 east of Cairo
					N/A			
Rawhide Creek	1940		Fremont		N/A			No detailed information available
Rawhide Creek	1944		Fremont		N/A			No detailed information available
Rawhide Creek	1945		Fremont		N/A			No detailed information available
Rawhide Creek	1957		Fremont		N/A			No detailed information available
Rawhide Creek	1971	303	Fremont		Unknown			No detailed information available
Republican	1876				N/A			
Republican	May 26, 1885		Cambridge, Richmond Canyon, Arapahoe		N/A	9		Monument dedicated to victims, who were buried in Cambridge.
Republican	June, 1895				N/A			
Republican	May, 1903				N/A			
Republican	June, 1905				N/A			24,500 cfs at Bostwick
Republican	Spring, 1908				N/A			
Republican	June, 1915				N/A			
Republican	May 28, 1935				N/A			First flood in a series - overflow equated to the "big flood" of 1915
Republican	June 1, 1935		McCook, Oxford, Culbertson	$10,000,000	N/A	113	see below	Worst NE flood - 280,000 cfs for Republican - 320 times normal discharge
Republican	June 1, 1935		Bloomington, Hardy, Max, Trenton		N/A			Bloomington: 20.4'/260,000 cfs (FS = 7.0'); river 1-4 miles wide (usually 200-400 feet wide)
Republican	June 1, 1935		Cambridge		N/A			Cambridge: 280,000 cfs at confluence with Medicine Creek
Republican	June 10, 1935				N/A			Third flood of four in 20-day period - no information available
Republican	June 16/17, 1935				N/A			Last in a series of four floods - overflow equated to the "big flood" of 1915

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Republican	July 1, 1946		Franklin		N/A			Heavy rainfall caused flash flood, flooded basements and business on east side of Main Street, Center Creek bridge nearly lost
Republican	June 23, 1947		Cambridge, Orleans	$15,000,000	N/A	13		Cambridge: 7.5', Medicine Creek also flooding; Orleans: 14' record flood stage
Republican	June 23, 1947		Curtis, Alma, Medicine Creek	$250,000	N/A			Damages listed were to Curtis only
Republican	June 23, 1947		Bloomington, Franklin		N/A			15.1'/140,000 cfs (flood stage = 7.0'). 5" rain over 3 days, washed out Hwy. 10 bridge
Republican	March 21, 1960	98	Cambridge, Orleans		Unknown			Cambridge crest 10' (FS=9'); Orleans crest of 12' (FS=9')
Republican	June 22, 1960		Orleans		N/A			No report of flood damages or information
Rock Creek	June 16, 1964		Ceresco		N/A			Highway 77 under 5' water after 3.75" rain
Rock Creek	June 15, 1982		Ceresco		N/A			18.84'/10,800 cfs
Salt Creek	1874		Lincoln		N/A			3 feet lower than 1908 flood
Salt Creek	April 1891		Lincoln		N/A			1.5 feet lower than 1908 flood
Salt Creek	1906		Lincoln		N/A			
Salt Creek	July 6, 1908		Lincoln	"many thousands"	N/A	9		33.6'/30,650 cfs. 2.5" rain in 2 hrs, 6.5-7" total; over 2' water on "O" & 12th -14th St., Antelope Valley flooded to G St.;
					N/A			O St. flooded 8th St. E - 24th W., 1000 homeless Salt Creek Bottoms submerged, houses destroyed
Salt Creek	July 6, 1908		Syracuse, Hickman		N/A			Syracuse: 7" of rain closed RR traffic
Salt Creek	July 6, 1908		Ashland		N/A	1	all bridges	21.21', no cfs data available - 2.5' higher than previous record, man died trying to save his chickens
Salt Creek	May 12, 1942		Lincoln	$600,000	N/A	1		19,400 cfs; 600 homes and 70 businesses flooded; crops, highways, railroads also damaged
Salt Creek	June 5, 1947		Ashland		N/A			Dike broke, 33 families evac, 20 blocks and 1000's of ag acres flooded
Salt Creek	June 13, 1947		Ashland		N/A			15.13'/26,100 cfs
Salt Creek	June 23, 1947		Ashland	$500,000	N/A			4th flood in 4 weeks; 30 families evac; dam est for State roads only; 21,000 cfs
Salt Creek	March 6, 1949		Ashland		N/A			New record discharge: 14.14' at 26,100 cfs
Salt Creek	May 8, 1950		Roca		N/A			26.0'/67,000 cfs
Salt Creek	May 8, 1950		Lincoln	$1,643,000	N/A	9		27,800 cfs, 26.05' crest highest since 1908; 20,000 acres flooded; 5.5" rain in 6 hours. 14" total in period; 600 homes, 80 businesses flooded
Salt Creek	June 2, 1951		Bennett		N/A			6.75" of rain
Salt Creek	June 2, 1951		Ashland		N/A			14.25'/46,200 cfs - families evacuated after river broke dikes, 17-year flood
Salt Creek	June 2, 1951		Lincoln		N/A			New record: 26.15' at 28,200 cfs
Salt Creek	July 15, 1952		Roca		N/A			Crest was 20.8' (FS=15.0'). Able to enter town from E only. N,S,W closed.
Salt Creek	Sept. 21, 1955		Lincoln		N/A			2.35" rain - water car windshield high. Roads closed on E. "O" and Crnhskr
Salt Creek	July 3, 1956		Roca, Hickman		N/A			4.5" rain covered Hwy 77 in places but towns were not severely impacted
Salt Creek	July 11, 1958		Ashland		N/A			1.9" in 15 min. Creek 2.6' over FS. U.S. 77 closed
Salt Creek	May 5, 1959		Roca		N/A			Upto 4.5" rain in area. Salt Creek crest of 21.0' (FS=19.0')
Salt Creek	August 3, 1959		Ashland		N/A			Water 2' over Hwy 63. "Worst rain we ever had."
Salt Creek	March 28, 1960	98	Roca		Unknown			Five feet over flood stage
Salt Creek	April 4, 1960	98	Lincoln		Unknown	1		4-year-old boy fell into drainage ditch and washed into storm sewer
Salt Creek	June 25, 1963		Lincoln		N/A			
Salt Creek	June 25, 1963		Ashland, Hickman	$98,000	N/A	3		Ashland: 14.82'/87,000 cfs; 75-year flood; damage estimate for Hickman only
Salt Creek	June 16, 1964		Lincoln, Ashland		N/A	1		3" rain in one hour. Ashland: 13.25' (FS=11')
Salt Creek	June 13, 1984	716	Lincoln		Unknown			20.92'/15,600 cfs - 10-year flood
Salt Creek	June 13, 1984	716	Greenwood		Unknown			46,800 cfs the greatest discharge in 33 years of records
Salt Creek	June 13, 1984	716	Ashland		Unknown			Water damaged 40 homes and 5 businesses, highway 6 bridge collapsed, locals said worst since 1908, Guard camp flooded
Salt Creek	July 24, 1993	998	Lincoln		$47,799,461.00 (1993 dollars)			Creek 6' over FS at 27th St. at 26.5' - levee protects to 28' Devaney Center threatened. Sandbagging.
					N/A			
Sappa Creek	June 22, 1947		Stamford	$152,000	N/A			20.10' with 7,430 cfs discharge
Sappa Creek	March 23, 1960	98	Beaver City		Unknown			20.03'/5690 cfs
Sappa Creek	June 23, 1966		Beaver City		N/A			Prairie Dog Creek also flooding; 20.03'/8070 cfs
Sappa Creek	June 23, 1966		Stamford	$505,000	N/A			7.1" of rain; 22.02'/32,000 cfs - more than 100-year storm and flood, flooding in town, farms evacuated

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
School Creek	July 15, 1952		Sutton, Fairmont		N/A			Sutton: Heavy rains caused Creek to flood basements; Fairmont: 7.15" rain
					N/A			
Shell Creek	June, 1947		Schuyler		N/A			All bridges 25 mi upstream of Hwy 30 inaccessible, water flowed to Rawhide Creek
Shell Creek	June 2, 1950		Newman Grove, Columbus		N/A			Newman Grove: 11,600 cfs, part of town inundated; Columbus: 5970 cfs/21.7'
Shell Creek	July 19, 1950		Newman Grove, Columbus	$68,800	N/A			Newman Grove: 12,000 cfs at 20.20'; Columbus: 5,970 cfs at 21.38'
Shell Creek	June, 1967	228	Columbus		Unknown			20.57' at 3000 cfs (100-year flow rate = 8,650 cfs)
Shell Creek	June 12, 1990	873	Lindsay		$49,828,934.00 (1990 dollars)			4-5" rain washed away empty ammonia tanks and 15-20 cars
Shell Creek	June 12, 1990	873	Platte Center		$49,828,934.00 (1990 dollars)			4-5" rain flooded one-third of Village
Shell Creek	June 14-17, 1990	873	Columbus		$49,828,934.00 (1990 dollars)			50-year flood; Columbus: 8,000 cfs
Shell Creek	June 18, 1990	873	Rogers		$49,828,934.00 (1990 dollars)			Town flooded to depth of 2-3 feet for 2 days
Silver Creek tributary	August 2, 1959		Colon		N/A			19.29'/4640 cfs - highest flood known since 1895
Silver Creek	August 3, 1959		Ithaca		N/A			16.92'/21,600 cfs - probably around the 50-year flood
Silver Creek	June 15, 1967	228	Silver Creek		Unknown			Flooding basements, some evacuations, water 1' deep over several blocks
Silver Creek	June 24, 1967	228	Shelton		Unknown			Crest of 8'
Skull Creek	April 11, 1905		Linwood		N/A			Photo evidence only - no detailed account
Skull Creek	August 3, 1959		Linwood		N/A			Every home flooded
Skull Creek	June 25, 1963		Linwood		N/A	1		8' deep in parts of town, 72 of 77 homes damaged, 65 of 72 "major"
Soldiers Creek	July 10, 1958		Crawford		N/A			21.90'/3970 cfs
Spring Creek	May 10, 1953		Cushing		N/A			19.44'/5350 cfs
Spring Creek	August 12, 1966	221	Wolbach		Unknown			15" of rain near Greeley caused great runoff, some homes evacuated, Hwy. 22 washed out/damaged
Stevens Creek	June 15, 1982		Lincoln		N/A			18.85'/3820 cfs
Stevens Creek	June 13, 1984	716	Lincoln		Unknown	2		19.57'/4620 cfs swept car off Highway 34, killed two - 10-year flood
Tekamah Creek	June 5, 1963		Tekamah		N/A			16.62'/6180 cfs
Tekamah Creek	June, 1944		Tekamah		N/A			135-year flood, water was 4-5' deep at 13th and L Streets, some log jams
Town Branch	June, 1944		Tecumseh		N/A			11" rain fell in watershed; 11 floods recorded for Town Branch since 1907
Turkey Creek	June 22, 1947		Naponee		N/A			One of greatest floods known, but stage and discharge unknown
Turkey Creek	May 9, 1950		DeWitt	$203,700	N/A			Every house flooded; 21,400 cfs discharge
Turkey Creek	June, 1957		Wilber		N/A			15.5' record crest
Turkey Creek	June 25, 1963		Wilber, DeWitt		N/A			3.5 feet over flood stage, considerable damage in DeWitt - res and bus
Turkey Creek	May 24-27, 1965		Wilber		N/A			6-8" of rain on May 21 and 22 caused a crest of 14.05' (11' FS)
Turkey Creek	March 25, 1969		Geneva, Wilber		N/A			Turkey Creek 4.6' over flood stage
Turkey Creek	1973	406	DeWitt		Unknown			50-year flood recurrence interval, considerable damage in DeWitt - residential and businesses
Turkey Creek	June 13, 1984	716	Wilber		Unknown			21.43'/33,000 cfs
Turkey Creek	June 13, 1984	716	DeWitt		Unknown			Turkey and Swan Creeks flooding severely, entire town flooded- up to 5', all 700 of population evac'd for 3 days
Turtle Creek	April 3, 1960	98	Ord		Unknown	1		Man drowned after falling into Creek
Union Creek	June 2, 1950		Madison		N/A			Much of town inundated, 15,700 cfs peak discharge
Union Creek	June 21, 1960		Madison		N/A			15 homes with first-floor flooding, basements flooded of 30 more
Union Creek	May 19, 1982		Madison		N/A			21.15'/5540 cfs
Union Creek	June 17, 1984	716	Madison		Unknown			22.90'/7630 cfs
Union Creek	June 18, 1990	873	Madison		$49,828,934.00 (1990 dollars)			Record crest
Verdigre Creek	June 19, 1951		Verdigre		N/A			Water 2' over Highway 14 bridge, 3 families evacuated
Verdigre Creek	March 28, 1962		Verdigre		N/A			Ice jam caused flooding in town, 10 families had left
Verdigre Creek	June 8, 1967	228	Verdigre		Unknown			Evacuations and rescues - business district was flooded
Wahoo Creek	1910		Ithaca		N/A			22.34'/18,900 cfs
Wahoo Creek	June 20, 1942		Wahoo		N/A			Cloudburst caused flooding of 2-3' on outskirts of Wahoo, 20 evacuated from trailer park

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Wahoo Creek	Feb. 28, 1950		Ithaca		N/A			New record: 21.08' at 5,430 cfs
Wahoo Creek	5/31-6/2, 1951		Memphis		N/A			Half of business district and 2 homes flooded
Wahoo Creek	5/31-6/2, 1951		Wahoo	$7,200	N/A			Dance Island submerged, 5 homes and 5 businesses flooded
Wahoo Creek	5/31-6/2, 1951		Ithaca		N/A			New record: 22.34' at 18,900 cfs; 20 families evacuated, business district flooded
Wahoo Creek	June 7, 1951		Wahoo, Ithaca	$560,000	N/A			5+" rain in 2.5 hrs- Wahoo isolated,highest water in 19 yrs,Ithaca:in 16 yrs
Wahoo Creek	August 3, 1959		Wahoo, Ithaca	$1,000,000	N/A			Wahoo isolated. Ithaca: 23.22'/45,300 cfs (highest flood known since 1910), Hwy 30A west of Wahoo washed out
Wahoo Creek	March 29, 1960	98	Wahoo, Ithaca		Unknown			Hwy 77 bridge washed out at Wahoo, lowlands flooded in Ithaca
North Fork Wahoo Creek	June 24, 1963		Wahoo	$113,000	N/A			81,400 cfs at Hwy 30A bridge 5 mi. W of Wahoo. 40 homes, 10 businesses, fairgrounds, athletic field flooded
Wahoo Creek	June 25, 1963		Ithaca, Prague		N/A			Ithaca: 22.93' at 77,400 cfs; Prague: 8" rain
Wahoo Creek	June 25, 1963		Wahoo	$113,000	N/A			50 fam evac from south side; 40 res, 10 bus dam; Creek highest of record
Wahoo Creek	June 16, 1964		Wahoo		N/A			15,400 cfs maximum discharge. Wahoo isolated. 4.2" rain, basements flooded, water 2' over highway 77
Wahoo Creek	June 9-14, 1967	228	Ithaca	$280,000	Unknown		$600,000	21.7' at 12,500 cfs - $280K - infrastructure, $600K - agriculture, both estimates for entire flooded area
Walnut Creek	1923		Crete		N/A			Caused flooding in residential areas in northern part of Crete
Walnut Creek	1930		Crete		N/A			Caused flooding in residential areas in northern part of Crete
Walnut Creek	1950		Crete		N/A			Caused flooding in residential areas in northern part of Crete
Walnut Creek	1951		Crete		N/A			Caused flooding in residential areas in northern part of Crete
Warm Slough	May 31, 1951		Central City		N/A			5.6" rain in two days overflowed into Trouble Creek, which flooded 12 basements and damaged lawns
Warm Slough	June 14-18, 1967	228	Central City		Unknown			13" rain in period caused estimated peak flow of 600 cfs at Hwy. 14 bridge - no damage information
Warm Slough	June 24, 1968		Central City		N/A			Observers say this flood slightly lower than 1967 flood - several roads overtopped by Slough, Trouble Creek
Weeping Water Creek	1888		Weeping Water		N/A			No detailed information available
Weeping Water Creek	1907		Weeping Water		N/A			No detailed information available
Weeping Water Creek	1947		Weeping Water		N/A			Discharges half as much as 1950 flood
Weeping Water Creek	May 9, 1950		Nehawka	$806,100	N/A			Approx. 100-year flood;4.5-8.5" rain;many basements flooded;2.5' at auditorium
Weeping Water Creek	May 9, 1950		Union		N/A	1		Maximum recorded discharge of 60,300 cfs with gage height of 26.80' (current gage)
Weeping Water Creek	May 9, 1950		Weeping Water		N/A			30,300 cfs; 77-year flood; bridges destroyed or damaged; RR washed-out
Weeping Water Creek	June 13, 1984	716	Weeping Water, Union, Nehawka		Unknown			29.53'/53,500 cfs at Union second to 1950 flood, urban damage in all three towns
Weeping Water Creek	July 23, 1993	998	Weeping Water, Union		$47,799,461.00 (1993 dollars)			"Extreme flooding"
White	March 15, 1948		Crawford		N/A			Crest of 6.88' (FS=4.0'), 1580 cfs
White	Sept. 4, 1951		Whitney		N/A			16.21'/1330 cfs
White	July 10, 1958		Crawford		N/A			7.7' gage height
White	May 11, 1991	908	Glen		$4,191,578.00 (1991 dollars)			7 inches of rain fell
White	May 11, 1991	908	Crawford	$19,800,000	$4,191,578.00 (1991 dollars)	1		Crest of 16.32' (FS=4'), 13,300 cfs, 1-2" rain, estimated to be 200-300 year flood, water over Hwy 71
White	May 11, 1991	908	Fort Robinson		$4,191,578.00 (1991 dollars)			2-4 inches of rain fell
Wood	June 20, 1947		Wood River		N/A			Record flow for Wood River at Grand Island
Wood	June 20, 1947		Grand Island	$5,000	N/A			Stolley State Park flooded, water over Highway 2 for one mile
Wood	June 20, 1947		Riverdale		N/A			6 inches of rain in 4 hours caused a peak stage of 19.75' stage at 20,000 cfs
Wood	June 10, 1949		Riverdale		N/A			1200 cfs, gage height of 10.97'
Wood	June 10, 1949		Gibbon		N/A			1.62" rain fell in one hour, led to 15.63' gage height at 1,600 cfs
Wood	June 10, 1949		Grand Island	$219,000	N/A			Monetary damages not only for Grand Island. Woodland and Riverside golf courses had extensive dam
Wood	July 10, 1950		Gibbon		N/A			1,680 cfs at 15.74' - records
Wood	1960	98	Gibbon		Unknown			New records 16.14' and 2,100 cfs

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
Wood	5/26-6/16, 1967	228	Riverdale, Gibbon		Unknown			Riverdale 15.6'/5400 cfs;Gibbon 16.78'/3500cfs (R), water 1' deep over sev blks
Wood	5/26-6/16, 1967	228	Grand Island	$6,250,000	Unknown	3		1800 bldgs flooded, 6' crest (3.5'FS);25,000 cfs;Flood reached 100-year level, 1/3 of city affected (11,000 or 28,600 residents);
					N/A			Wood River,Prairie Creek, Silver Creek all flooding, $3M in ag damage
Wood	June 24-26, 1968		Grand Island		N/A			Grand Island crest at 6', 5-6" rain over large area, Prairie Creek also flooding
Wood	June 24-26, 1968		Gibbon, Alda, Kenesaw		N/A			Gibbon: 9.5" rain/13.5' crest; Alda: 11.7' crest; Kenesaw: basements flooded
Wood	June 24-26, 1968		Wood River		N/A			5.8' maximum crest on 6/27. West of town, River was 1.5 miles wide
Wood	June 24-26, 1968		Kearney		N/A			7.5-8" rain caused street flooding in Kearney
Wood	March 18, 1969		Riverdale, Gibbon		N/A			Riverdale: crest 13' (11.0' FS); Gibbon: 12.0' crest
Wood	March 18, 1969		Grand Island, Alda		N/A			Alda: 12' crest; Grand Island: 5.5' crest
					N/A			
Other flood info					N/A			
	May/June, 1935		Republican River flood		N/A			11,400 cattle; 41,500 poultry; 341 miles of highway; 307 bridges; 74,500 acres
					N/A			
	June, 1940		Elkhorn - Cuming County	$300,000	N/A			Damage estimate for public facilities and bridges in Cuming County only
					N/A			
	June, 1944		Elkhorn - Scribner to mouth	$6,800,000	N/A			4" rain of entire over most of basin, up to 16.5". Record peaks from Scribner to mouth,
					N/A			125,000 acres of farmland inundated, 17 communities seriously damaged
					N/A			
	May-July, 1950		Southeastern Nebraska	$64,910,722	N/A			This flood resulted in $500,000 in State/$250,000 in Federal aid
			Salt Creek basin		N/A			$2,880,000 in basin - $1,643,000 in Lincoln
					N/A			
	April, 1952		For entire 1952 Missouri flood	$30,564,000	N/A			3203 families w/ losses, 4149 families aided, 123 buildings desroyed, 2768 damaged, 681 farms flooded, 25 people injured. Dakota Co. hit hardest in NE
					N/A			
	March/April,1960	98	Across State	$3,300,000	Unknown			50 counties declared disaster areas by President Eisenhower
			Across State		N/A			8000 people affected, 1664 homes (100 destroyed)
					N/A			
	March/April, 1960	98	Loup basin		Unknown			151 homes flooded, 15 persons evacuated, 1 killed (Ord), 29,800 acres flooded
			Elkhorn basin		N/A			700 homes/ 20 commercial structures flooded, 712 evacuated, 96,200 acres flooded
			Platte basin		N/A			768 homes/60 businesses flooded, 1519 evacuated, 2 killed (Lincoln, Valley), 71,900 acres flooded
			Missouri basin		N/A			Omaha-Rulo. 181 homes/21 businesses flooded
					N/A			
	June, 1960		Eastern Nebraska		N/A			Disaster declaration counties: Dodge, Madison, Douglas, Sarpy
					N/A			
	March/April, 1962				N/A			$340,000 granted to NE from Kennedy admin.; $260,000 for pub. Facilities
					N/A			
	June, 1963		Southeast Nebraska	Up to $10M private	N/A		Upto $3M public	Kennedy Admin. declared 8 counties disaster areas
			Wahoo Creek basin	$1,500,000	N/A			
					N/A			
	June 16, 1964		Omaha counties		N/A			Sarpy and Douglas Counties declared disaster areas
			All areas (Cass, Saunders, Mad.)	$4,962,000	N/A			441 homes w/ major dam, 640 w/ minor dam, 14 trailers dest, 71 w/ maj dam
					N/A			
	August, 1966	221	Loup River basin	$1,317,250	Unknown			Platte, Nance, and Boone counties. 3 homes destroyed, 329 w/ major damage, 13 businesses damaged
					N/A			
	May/June, 1967	228	For entire 1967 Platte flood	$49,309,015	Unknown			$8.5M public dam, 40.8M private - of private: $23M ag, 5M urb, 12M trans.
	6/15-6/20, 1967	228	Eastern Nebraska	$30,690,985	Unknown			$80M total damage in NE - 1 million acres flooded, 4000-5000 homes/businesses affected by flooding
					N/A			

Appendix E Nebraska Flooding History Summary

River	Date	FEMA Disaster Declaration Number	Communities Impacted	Estimated Damages - Historical Media Accounts[1]	Estimated Damages - FEMA Disaster Declarations[2]	Deaths	Other Losses	COMMENTS
	Feb 20-23, 1970		Mostly Elkhorn and Platte areas	$2,777,200	N/A	1		Governor Exon requested disaster declaration from Nixon. 15 counties declared
					N/A			
	March/April, 1978	552	Platte River	$18,500,000	Unknown	1		Colfax,Cass,Dodge,Douglas,Platte,Sarpy,Saunders. $12M in residential damage-1609 structures
			Missouri River	$5,000,000	N/A			Omaha to Rulo flooding from Platte; 83,000 acres inundated.
					N/A			
	June, 1984	716	Eastern Nebraska	$79,000,000	Unknown			Missouri, Elkhorn, Blue, Platte, Salt Creek, Weeping Water Creek all flooding. 44 counties had flood damage, 23 declared disaster areas

1 - Damages from historical accounts typically have a dollar basis from the year of the historical account, which is typically the same as the actual damage event. However, this may be vary among the different historical accounts.

2 - Damages from disaster declarations represent estimated public assistance dollars awarded for the entire declared disaster. Total dollar values are noted by disaster, and may be listed multiple times since they may be applicable for more than one community or flooding source.

APPENDIX F

NDNR FLOOD RISK MAP BUSINESS PLAN

APPENDIX G

DETAILED SUMMARY OF MITIGATION ACTION TYPES FROM LOCAL HMP'S

FIGURE I.1 HAZARD MITIGATION PLAN SUMMARY
FIGURE 1.2 APPENDIX G KEY

Appendix G is a summary of approved Mitigation Actions listed in local Hazard Mitigation Plans (HMP's). In accordance with the purpose of this document, local Hazard Mitigation Plans were reviewed to assess and summarize the history of local flood risk, vulnerabilities, and past recommended mitigation actions. To date, there are twenty-six local Hazard Mitigation Plans covering all but four of Nebraska's counties. The jurisdictions of the plans varies and may be by village or city, county, Natural Resource District (NRD), or Nebraska Emergency Management Agency (NEMA) region. Thirteen plans hold jurisdiction in nineteen counties; twelve plans cover fifteen NRDs; and two plans cover two NEMA regions. See below the figure demonstrating the counties covered by local HMP's.

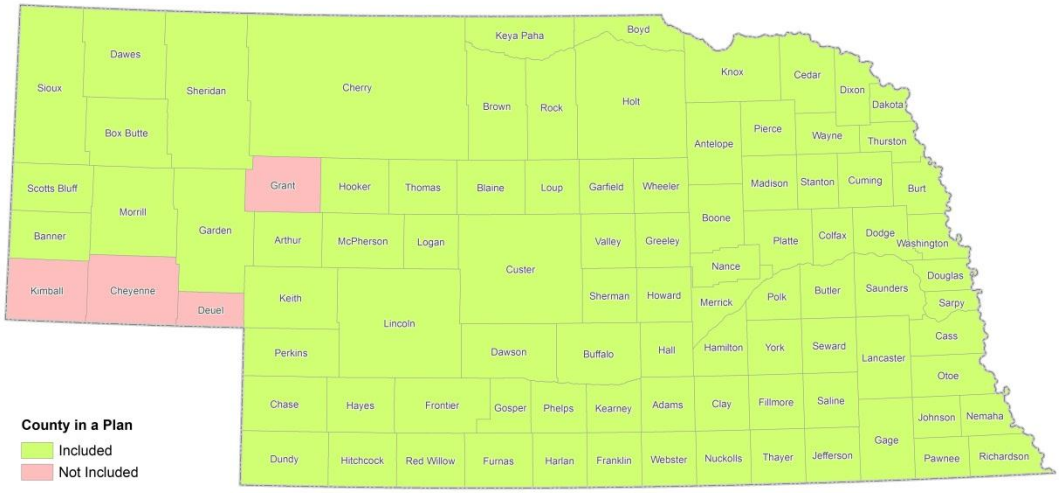


FIGURE I.1 HAZARD MITIGATION PLAN SUMMARY

Every local HMP typically lists recommended mitigation actions for each jurisdictional unit and may include additional units such as county and village or city. The language of each plan varies, but since most plans list Mitigation Action Types for counties; counties were chosen as the unit to list Mitigation Action Types for the purposes of the summary in Appendix G. Recommended mitigation actions for cities and villages were also reviewed in local HMP's and are listed in the Mitigation Action Types table according to their respective counties.

A recommended mitigation action was listed in the table if it met one of the three possible scenarios:

1. The mitigation action is recommended for the county,

2. The mitigation action is recommended for most of the cities and villages in the county,

or

3. The recommended mitigation action was recommended for a city that is a very large population center within the county (example, Omaha in Douglas County).

As an example, about fifty percent of the cities in Cedar County, including the most populous cities, participate in the National Flood Hazard Program, but the county does not; therefore, both "Participate in NFIP" and "Maintain Compliance with NFIP" were listed under Cedar County in the Mitigation Action Types table. The opposite is true in Butler County, where fifty percent of the cities/villages do not participate in the NFIP and the county does; the result is the same type of listings in the Mitigation Action Types table.

Below is a key listing explanations or examples of the Mitigation Action Types found in local HMP's. In some cases, similar but distinctly different action types were listed in local plans; due to this both action types were added to the table:

FIGURE I.2 APPENDIX G KEY

Mitigation Action	Explanation
CATEGORY: FLOODPLAIN MANAGEMENT AND DATA DEVELOPMENT ACTIONS	
Participate in NFIP	County/Community does not currently participate in the NFIP; recommendation is for the County/Community to participate.
Maintain Compliance with NFIP	County/Community currently participates in the NFIP; recommendation is to maintain NFIP Compliance.
Participate in CRS	County/Community does not currently participate in CRS; recommendation is for the County/Community to participate.
Enhance Floodplain Regulations	Write/revise floodplain regulations and ordinances. Consider implementation of higher standards for floodplain management.
Enhance Floodplain Regulation Enforcement	Revise enforcement of Floodplain Regulations, implement stricter permitting enforcements, and educate building inspectors or CFMs.
Maintain or Enhance Floodplain Management Activities	Activities other than floodplain regulations and mapping: adopting maps, coordinating with State and FEMA on floodplain management activities, monitoring activities, explanations of the NFIP to improve local involvement.
Enhance Emergency Management Regulations	Write/revise Emergency Management responses to flooding.
Enhance Stormwater Management Regulations	Write/revise stormwater regulations to alleviate flooding, including ordinances.
Create/revise Stormwater Management Plan	Create/revise Stormwater Management Plan, with an emphasis on reducing flood risk.

Mitigation Action	Explanation
Acquire New Floodplain Mapping Studies, Data, or Software	Acquire new maps, data, software, map changes, drainage studies, etc.
Maintain Floodplain Mapping	Maintenance of floodplain mapping; updates to flood information.
Complete New or Updated Flood Risk Mitigation Studies or Plans	This could include Comprehensive Plans, Emergency Plans, Mitigation Plans, Evacuation Plans, etc. that also deal with flooding responses.
Public Education and Outreach Projects	This includes flooding specific public education or a general category that includes flood or dam safety education.
CATEGORY: INFRASTRUCTURE ASSESSMENT & MITIGATION ACTIONS	
Safe Room/ Storm Shelters	Either improvements or addition of safe rooms and storm shelters for the purpose of providing protection from weather events, including flooding.
Evaluate Critical Facility Infrastructure	Studies to evaluate what needs to be updated, inspections, and inventory of things like weather radios for critical facilities.
Enhance Critical Facility Infrastructure	Additions/updates to critical facilities that may include generators, infrastructure updates, and adding weather radios.
Evaluate Stormwater Infrastructure	Studies to evaluate what needs to be updated, inspections.
Enhance Stormwater Infrastructure	Mostly includes training personnel or storm warning system implementations or improvements.
Evaluate Emergency Management	Studies to evaluate what needs to be updated or acquired. Inspections of civil service infrastructure fall under this category.
Enhance Emergency Management	Mostly includes training personnel, improving emergency communications, implementing or improving generic warning systems, implementing or improving flood and dam warning systems, and general improvements to Civil Service Infrastructure.
Identify High Risk Infrastructure	Studies to identify high flood risk infrastructure.
Relocate, Elevate, or Acquire and Remove High Risk Property and Infrastructure	Modifications to high risk property or infrastructure to reduce flooding risk, potentially including acquisition and removal.
Floodproof High Risk Property and Infrastructure	Floodproofing of high risk property or infrastructure by retrofitting existing structures. Only applicable to non-residential structures.

Mitigation Action	Explanation
CATEGORY: FLOOD CONTROL PROJECTS & RELATED PROJECTS	
Streambank Stabilization and Erosion Control Projects	Stream bank stability projects that mitigate the potential for damage to the stream bank and adjacent infrastructure or property.
Projects to Enhance Watershed Drainage	Mostly includes channel improvements, alleviating ice jams or bottlenecks, and adding channels.
Dam Projects	Develop, Improve, or maintain dams.
Levee Projects	Develop, Improve, or maintain levees.
Other Flood Control	May include construction of berms, detention cells, retention ponds, or identification of an appropriate flood control structure.
Enhance Roads and Drainage Structures	May include building or rebuilding bridges or culverts and grading or lifting roads.

Appendix G Nebraska Mitigation Plans - Detailed Summary of Mitigation Action Types from Local HMP's

		FLOODPLAIN MANAGEMENT AND DATA DEVELOPMENT ACTIONS													INFRASTRUCTURE ASSESSMENT & MITIGATION ACTIONS										FLOOD CONTROL PROJECTS & RELATED PROJECTS					
Plan ID	**Counties Included**	**Participate in NFIP**	**Maintain Compliance with NFIP**	**Participate in CRS**	**Enhance Floodplain Regulations**	**Enhance Floodplain Regulation Enforcement**	**Maintain or Enhance Floodplain Management Activities**	**Enhance Emergency Management Regulations**	**Enhance Stormwater Management Regulations**	**Create/revise Stormwater Management Plan**	**Acquire New Floodplain Mapping Studies, Data, or Software**	**Maintain Floodplain Mapping**	**Complete New or Updated Flood Risk Mitigation Studies or Plans**	**Public Education and Outreach Projects**	**Safe Room/ Storm Shelters**	**Evaluate Critical Facility Infrastructure**	**Enhance Critical Facility Infrastructure**	**Evaluate Stormwater Infrastructure**	**Enhance Stormwater Infrastructure**	**Evaluate Emergency Management**	**Enhance Emergency Management**	**Identify High Risk Infrastructure**	**Relocate, Elevate, or Acquire and Remove High Risk Property and Infrastructure**	**Floodproof High Risk Property and Infrastructure**	**Streambank Stabilization and Erosion Control Projects**	**Projects to Enhance Watershed Drainage**	**Dam Projects**	**Levee Projects**	**Other Flood Control**	**Enhance Roads and Drainage Structures**
Cedar & Dixon Counties	Cedar	X	X		X	X			X		X			X	X	X	X	X	X	X	X	X	X		X	X				X
	Dixon	X	X		X	X			X		X			X	X	X	X	X	X	X	X	X	X		X	X				X
Papio-Missouri River NRD	East half of Burt										X						X				X					X				
	Dakota		X									X			X		X				X				X					X
	Douglas		X						X			X					X	X	X		X	X	X	X	X	X		X		X
	Sarpy		X								X	X			X	X	X	X	X		X					X				X
	Thurston																													
	Washington		X						X			X	X	X	X		X		X	X	X	X				X				X
Tri-County	Antelope	X	X		X	X			X		X			X	X	X	X	X	X	X	X	X	X		X	X				X
	Holt	X			X	X		X			X			X	X	X	X	X	X	X	X	X	X		X	X				X
	Knox		X		X	X			X		X			X	X	X	X	X	X	X	X	X	X		X	X				X
Lower Elkhorn NRD	Pierce		X	X	X	X		X					X	X	X	X	X	X	X	X	X	X	X	X		X					X
	Wayne		X	X				X					X	X	X	X	X	X	X	X	X	X	X	X		X					X
	Stanton		X	X				X			X		X	X	X	X	X	X	X	X	X	X	X	X		X					X
	Cuming		X	X									X	X	X	X	X	X	X	X	X	X	X	X		X					X
	Madison	X		X	X	X							X	X	X			X	X	X	X	X	X			X	X	X	X		X
	Colfax		X	X				X			X		X	X	X	X	X	X	X	X	X	X	X	X		X	X		X		X
	West half of Burt County		X	X							X		X	X	X	X	X	X	X	X	X	X	X	X		X					X
Lower Platte North NRD	Butler	X	X		X	X	X			X	X	X	X	X		X	X	X	X	X	X					X	X	X			
	Dodge		X		X	X	X			X	X	X	X	X		X	X	X	X							X	X		X		
	Saunders		X		X	X				X	X	X	X	X		X	X	X	X	X	X	X	X			X	X	X	X		
Lower Platte South NRD	Lancaster	X	X	X								X	X	X		X	X	X	X	X	X	X	X			X	X		X		X
	Cass	X	X	X									X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X
Nemaha NRD	Otoe		X		X	X				X	X			X		X	X	X	X			X	X		X	X				X
	Richardson	X	X		X	X				X	X		X	X		X	X	X	X	X		X	X		X	X				X
	Nemaha		X		X	X				X	X			X		X	X	X	X	X	X	X	X		X	X		X		X

Appendix G Nebraska Mitigation Plans - Detailed Summary of Mitigation Action Types from Local HMP's

		FLOODPLAIN MANAGEMENT AND DATA DEVELOPMENT ACTIONS													INFRASTRUCTURE ASSESSMENT & MITIGATION ACTIONS										FLOOD CONTROL PROJECTS & RELATED PROJECTS					
Plan ID	**Counties Included**	**Participate in NFIP**	**Maintain Compliance with NFIP**	**Participate in CRS**	**Enhance Floodplain Regulations**	**Enhance Floodplain Regulation Enforcement**	**Maintain or Enhance Floodplain Management Activities**	**Enhance Emergency Management Regulations**	**Enhance Stormwater Management Regulations**	**Create/revise Stormwater Management Plan**	**Acquire New Floodplain Mapping Studies, Data, or Software**	**Maintain Floodplain Mapping**	**Complete New or Updated Flood Risk Mitigation Studies or Plans**	**Public Education and Outreach Projects**	**Safe Room/ Storm Shelters**	**Evaluate Critical Facility Infrastructure**	**Enhance Critical Facility Infrastructure**	**Evaluate Stormwater Infrastructure**	**Enhance Stormwater Infrastructure**	**Evaluate Emergency Management**	**Enhance Emergency Management**	**Identify High Risk Infrastructure**	**Relocate, Elevate, or Acquire and Remove High Risk Property and Infrastructure**	**Floodproof High Risk Property and Infrastructure**	**Streambank Stabilization and Erosion Control Projects**	**Projects to Enhance Watershed Drainage**	**Dam Projects**	**Levee Projects**	**Other Flood Control**	**Enhance Roads and Drainage Structures**
	Johnson		X		X	X				X	X			X		X	X	X	X			X	X		X	X				X
	Pawnee		X		X	X				X	X			X		X	X	X	X	X	X	X	X		X	X				X
Region 24	Boyd		X		X	X	X				X	X	X	X		X	X	X	X			X	X		X	X				X
	Brown	X	X		X	X	X			X	X		X	X		X	X	X	X			X	X		X	X	X			X
	Cherry	X								X	X		X	X		X	X	X	X			X	X		X	X				X
	Keya Paha	X									X			X		X	X	X	X			X	X		X	X				X
	Rock	X									X		X	X				X	X						X	X				X
Lower Loup NRD	Boone		X				X				X	X		X	X	X	X			X	X	X	X	X						X
	Custer	X	X				X							X	X	X	X	X	X	X	X	X	X							
	Garfield		X				X								X	X	X			X	X									
	Greeley		X				X								X	X	X	X	X	X	X									X
	Howard		X				X							X	X	X	X	X	X	X	X				X	X				
	Loup		X				X								X	X	X			X	X	X	X							
	Nance																													
	Platte		X				X		X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X
	Sherman		X				X							X	X	X	X	X	X	X	X	X	X					X			
	Valley		X				X							X	X	X	X			X	X								X		
	Wheeler		X				X								X	X	X	X		X	X				X	X				
Central Platte NRD	Buffalo		X		X	X	X		X				X	X	X	X	X				X	X	X		X	X				X
	Dawson		X				X							X	X	X	X					X	X							X
	Merrick		X		X	X	X														X	X	X							X
	Polk		X				X		X				X		X	X	X			X	X	X		X	X	X				X
Hall County	Hall						X							X		X	X					X	X			X			X	
Hamilton County	Hamilton	X	X							X	X		X	X						X	X	X	X			X				
York County	York	X	X		X					X				X		X	X	X	X	X	X	X	X		X	X				X
Seward County	Seward	X	X		X		X			X				X		X	X			X	X					X				
Lower Big Blue and Little Blue NRDs	Adams	X	X		X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X		X	X
	Clay													X	X	X	X			X	X					X				X
	Fillmore										X	X		X	X	X	X	X	X	X	X					X			X	X

Appendix G Nebraska Mitigation Plans - Detailed Summary of Mitigation Action Types from Local HMP's

		FLOODPLAIN MANAGEMENT AND DATA DEVELOPMENT ACTIONS													INFRASTRUCTURE ASSESSMENT & MITIGATION ACTIONS										FLOOD CONTROL PROJECTS & RELATED PROJECTS					
Plan ID	**Counties Included**	**Participate in NFIP**	**Maintain Compliance with NFIP**	**Participate in CRS**	**Enhance Floodplain Regulations**	**Enhance Floodplain Regulation Enforcement**	**Maintain or Enhance Floodplain Management Activities**	**Enhance Emergency Management Regulations**	**Enhance Stormwater Management Regulations**	**Create/revise Stormwater Management Plan**	**Acquire New Floodplain Mapping Studies, Data, or Software**	**Maintain Floodplain Mapping**	**Complete New or Updated Flood Risk Mitigation Studies or Plans**	**Public Education and Outreach Projects**	**Safe Room/ Storm Shelters**	**Evaluate Critical Facility Infrastructure**	**Enhance Critical Facility Infrastructure**	**Evaluate Stormwater Infrastructure**	**Enhance Stormwater Infrastructure**	**Evaluate Emergency Management**	**Enhance Emergency Management**	**Identify High Risk Infrastructure**	**Relocate, Elevate, or Acquire and Remove High Risk Property and Infrastructure**	**Floodproof High Risk Property and Infrastructure**	**Streambank Stabilization and Erosion Control Projects**	**Projects to Enhance Watershed Drainage**	**Dam Projects**	**Levee Projects**	**Other Flood Control**	**Enhance Roads and Drainage Structures**
	Gage										X	X			X	X	X	X	X							X				
	Jefferson										X				X	X	X	X	X										X	X
	Nuckolls														X	X	X			X	X					X				
	Saline														X	X	X	X	X	X	X	X		X		X		X		
	Thayer										X	X				X	X			X	X	X	X						X	X
	Webster														X	X	X	X	X	X	X				X	X				X
Upper Loup NRD	Hooker	X	X								X			X		X				X	X									
	Thomas	X	X								X			X		X				X	X					X				
	Blaine	X	X								X			X						X	X					X				
	Logan	X	X								X			X		X				X	X					X				
Twin-Platte NRD	Lincoln		X						X		X		X		X	X	X	X	X	X	X	X		X	X	X				X
	McPherson		X												X	X	X			X	X					X				
	Arthur														X	X	X			X	X									
	Keith										X	X								X	X	X	X			X				
Perkins County	Perkins	X	X							X	X			X		X	X	X	X	X	X	X	X			X				
Chase County	Chase	X	X							X	X		X	X		X	X	X	X	X	X					X				X
Dundy County	Dundy	X	X		X	X	X			X	X	X		X		X	X	X	X	X	X	X	X			X				X
Frontier County	Frontier				X											X	X													
Hayes County	Hayes	X	X								X			X		X	X	X	X	X	X	X	X							X
Hitchcock County	Hitchcock	X				X																								
Tri-Basin NRD	Gosper															X	X			X	X									
	Kearney													X		X	X									X				
	Phelps			X												X	X	X	X	X	X					X				
Quad County	Franklin	X	X							X	X			X		X	X	X	X	X	X				X	X				X
	Furnas	X	X								X			X		X	X	X	X			X	X		X	X				X
	Harlan	X	X								X			X		X	X	X	X	X	X	X	X		X	X				X
	Red Willow	X	X							X	X			X		X	X	X	X	X	X	X	X		X	X				X
Region 23	Box Butte	X									X			X		X	X	X	X	X	X	X	X			X				
	Dawes	X	X		X	X				X	X		X	X		X	X	X	X	X	X	X	X			X				
	Sheridan		X		X	X				X	X		X	X		X	X	X	X			X	X			X				
	Sioux	X									X			X		X	X	X	X			X	X			X				
North Platte NRD	Banner	X									X			X		X	X	X	X			X	X		X	X				X

Appendix G Nebraska Mitigation Plans - Detailed Summary of Mitigation Action Types from Local HMP's

		FLOODPLAIN MANAGEMENT AND DATA DEVELOPMENT ACTIONS													INFRASTRUCTURE ASSESSMENT & MITIGATION ACTIONS										FLOOD CONTROL PROJECTS & RELATED PROJECTS					
Plan ID	**Counties Included**	**Participate in NFIP**	**Maintain Compliance with NFIP**	**Participate in CRS**	**Enhance Floodplain Regulations**	**Enhance Floodplain Regulation Enforcement**	**Maintain or Enhance Floodplain Management Activities**	**Enhance Emergency Management Regulations**	**Enhance Stormwater Management Regulations**	**Create/revise Stormwater Management Plan**	**Acquire New Floodplain Mapping Studies, Data, or Software**	**Maintain Floodplain Mapping**	**Complete New or Updated Flood Risk Mitigation Studies or Plans**	**Public Education and Outreach Projects**	**Safe Room/ Storm Shelters**	**Evaluate Critical Facility Infrastructure**	**Enhance Critical Facility Infrastructure**	**Evaluate Stormwater Infrastructure**	**Enhance Stormwater Infrastructure**	**Evaluate Emergency Management**	**Enhance Emergency Management**	**Identify High Risk Infrastructure**	**Relocate, Elevate, or Acquire and Remove High Risk Property and Infrastructure**	**Floodproof High Risk Property and Infrastructure**	**Streambank Stabilization and Erosion Control Projects**	**Projects to Enhance Watershed Drainage**	**Dam Projects**	**Levee Projects**	**Other Flood Control**	**Enhance Roads and Drainage Structures**
	Garden		X		X	X	X			X	X	X	X	X				X	X						X	X				X
	Morrill	X	X		X	X				X	X		X	X		X	X	X	X	X	X	X	X		X	X				X
	Scotts Bluff	X	X		X	X	X			X	X	X	X	X		X	X	X	X	X	X	X	X		X	X				X
Not Identified in a Plan	Cheyenne																													
	Deuel																													
	Grant																													
	Kimball																													
TOTAL/TRENDS		37	63	10	29	27	24	5	10	23	52	18	30	64	39	76	77	60	60	62	67	56	51	7	46	65	6	11	6	54