

**NRD Profile**

# **Tri-Basin Natural Resources District**

**Tri-Basin NRD  
Hazard Mitigation Plan Update**

**2023**

## Local Planning Team

The Tri-Basin Natural Resources District’s (NRD) local planning team for the hazard mitigation plan are listed in the table below along with the meetings attended. All planning worksheets were filled out and returned by the local planning team.

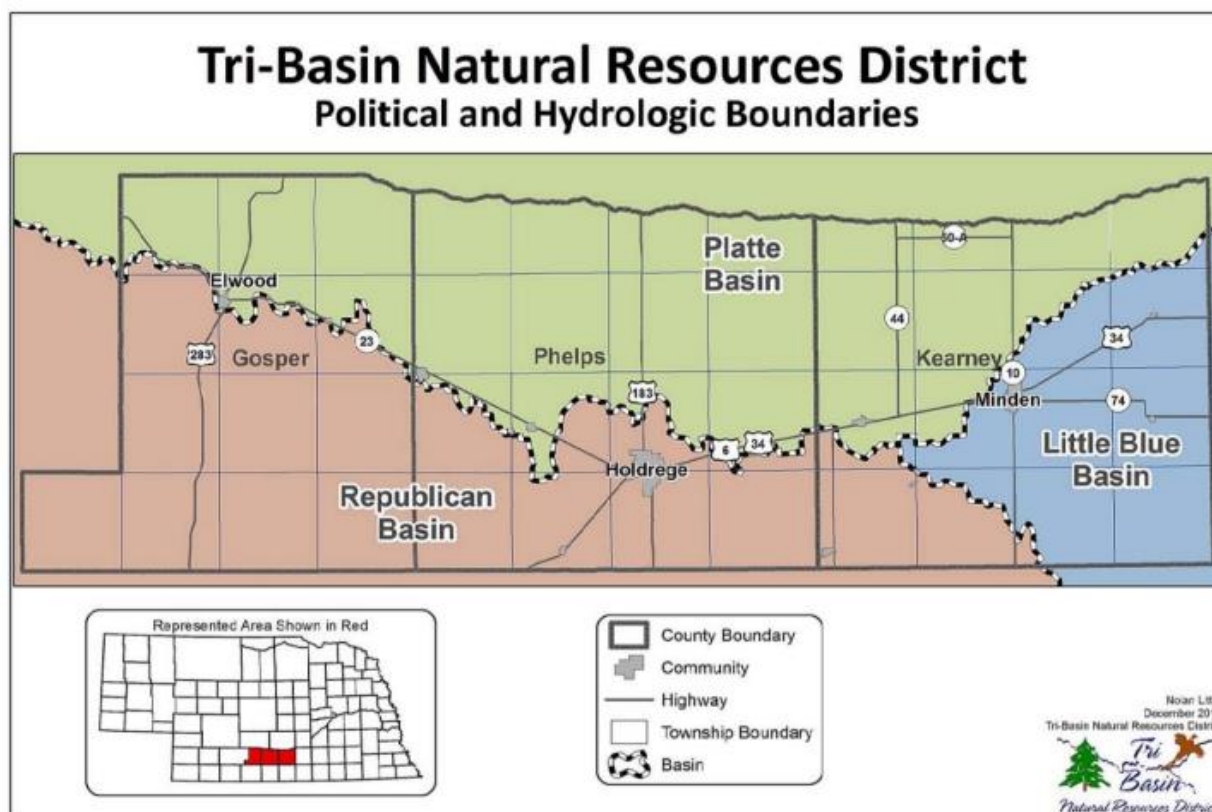
**Table NRD.1: Tri-Basin NRD Local Planning Team**

Name	Title	Jurisdiction	R1 Meeting	R2 Meeting
John Thorburn	General Manager	Tri-Basin NRD	Elwood, Holdrege	Elwood, Holdrege

## Location and Geography

The Tri-Basin NRD is located in south-central Nebraska and is comprised of Gosper, Phelps, and Kearney Counties. Major waterways in the district include Johnson Lake, Elwood Reservoir, Plum Creek, Turkey Creek, Muddy Creek, Deer Creek, North Dry Creek, Spring Creek, and the Platte River. The NRD includes portions of the Platte, Republican, and Little Blue River basins (Figure NRD.1). The Tri-Basin NRD topographic regions include plains, valleys, sand hills, dissected plains, and large reservoirs.<sup>1</sup> There are over 358,00 irrigation wells and over 550,000 NRD certified irrigated acres within the NRD. Groundwater supplies vary greatly in the district, with areas in the Central Nebraska Public Power and Irrigation District having rising groundwater levels and areas in the south-west and southeast corners having declining groundwater levels.

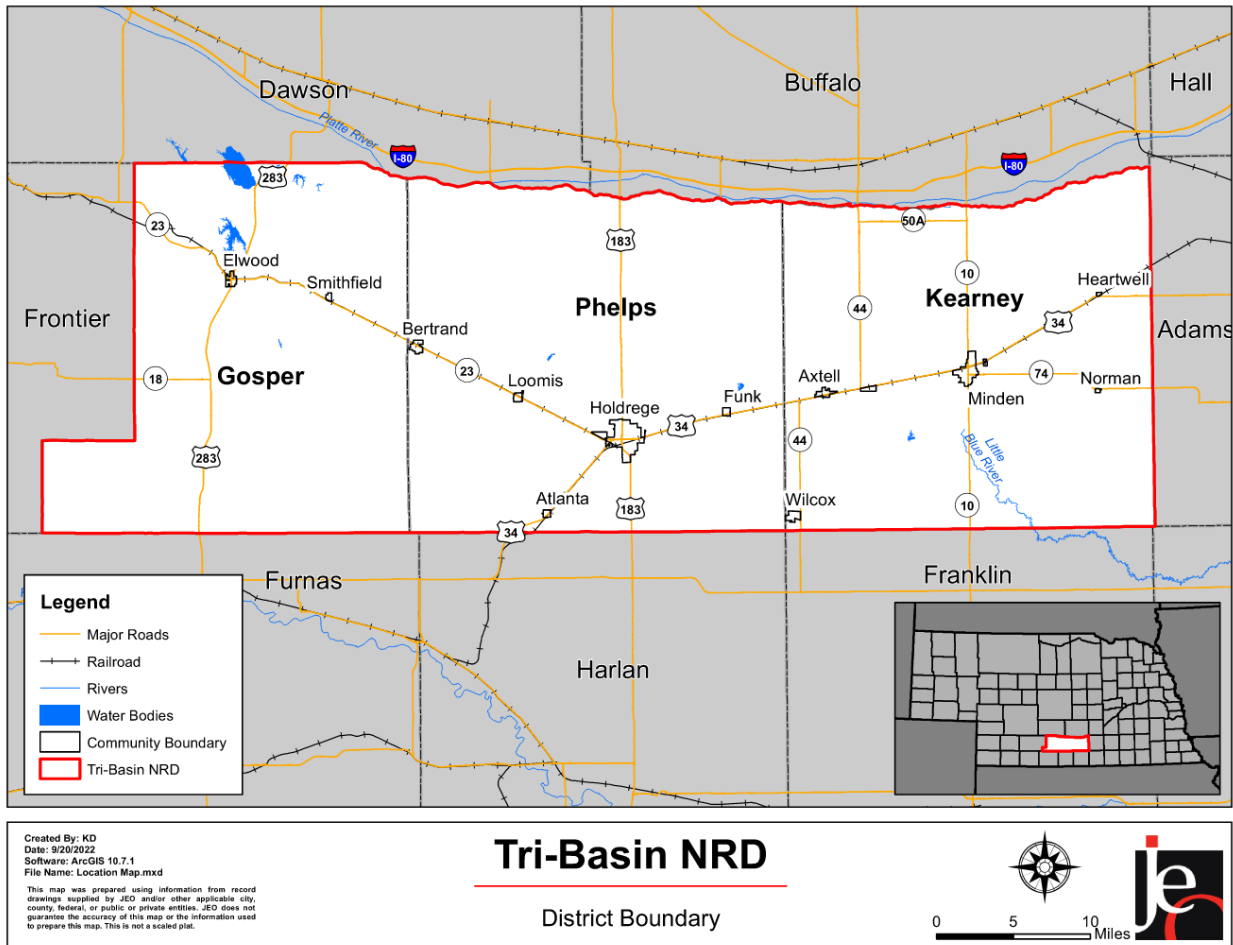
**Figure NRD.1: Tri-Basin NRD Hydrologic Boundaries**



Source: Tri-Basin NRD

<sup>1</sup> University of Nebraska-Lincoln, 1973. "Topographic Regions Map".  
<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1461&context=conservationsurvey>.

Figure NRD.2: Tri-Basin NRD Boundary and Communities

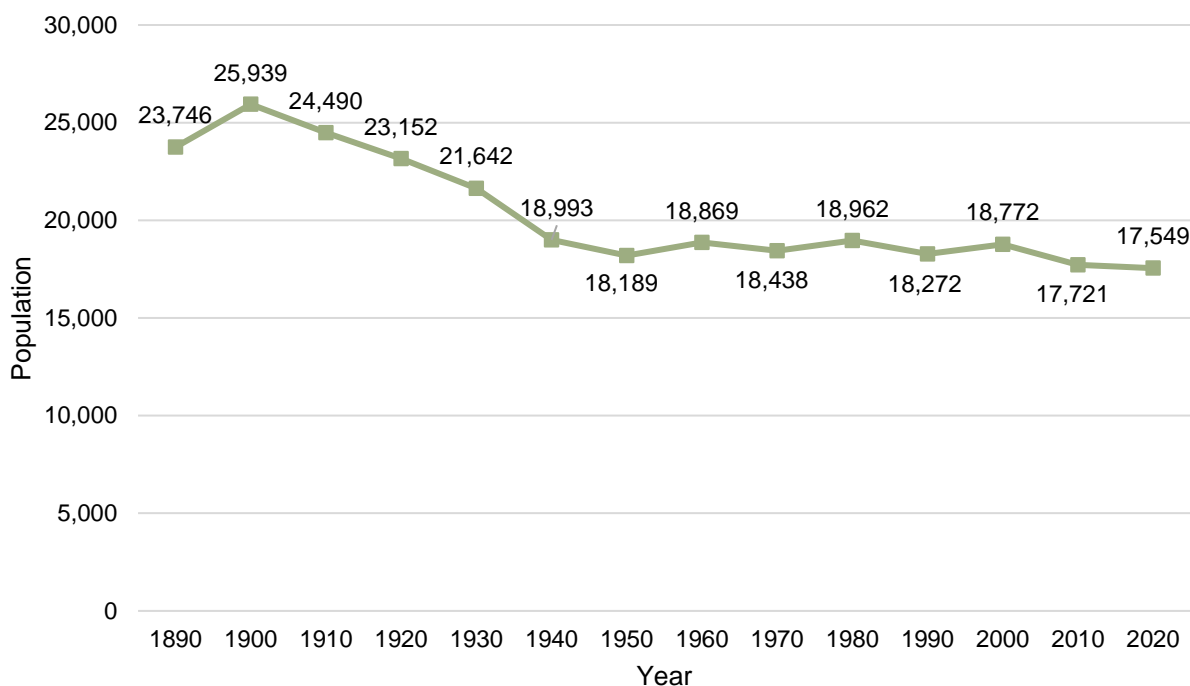


## Demographics

It is estimated that the Tri-Basin NRD serves a population of 17,549 people over three counties.<sup>2</sup> The following figure displays the historical population trend for the Tri-Basin NRD. This figure indicates that the population within the NRD has been declining since 2000. However, the local planning team indicated that the population has currently increased slightly since 2010. Increasing populations are associated with more robust hazard mitigation and emergency planning requirements for development. Growing populations can also increase tax revenues, allowing the NRD to pursue additional mitigation projects.

<sup>2</sup> United States Census Bureau. "2020 Census Bureau Decennial Census: P1: Race." <https://data.census.gov/>.

**Figure NRD.3: Population 1890 - 2020**



The young, elderly, and minority populations may be more vulnerable to hazards than other groups. Looking at the NRD’s population:

- **7.6% is non-white.** Since 2010, the Tri-Basin NRD became more ethnically diverse. In 2010, 3.1% of the NRD’s population was non-white. By 2020, 7.6% was non-white.<sup>3</sup>
- **Median age of 42.** The median age of people within the NRD was 42.0 years old in 2020. The population became slightly younger since 2010, when the median age was 42.5.<sup>4</sup>

## Employment and Economics

Low-income populations, long distance commuters, and the unemployed may be more vulnerable to certain hazards like extreme heat and flooding than other groups. The population within the Tri-Basin NRD has:

- **10.2% of people living below the poverty line.** The poverty rate (10.2%) in the Tri-Basin NRD was slightly lower than the state’s poverty rate (10.4%) in 2020.<sup>5</sup>
- **\$60,685 median household income.** The NRD’s median household income in 2020 (\$60,685) was \$2,330 lower than the state (\$63,015).<sup>5</sup>
- **1.3% unemployment rate.** In 2020 the population within the NRD has a lower unemployment rate (1.3%) when compared to the state (3.4%).<sup>5</sup>

3 United States Census Bureau. “2020 Census Bureau American Community Survey: DP05: ACS Demographic and Housing Estimates.” <https://data.census.gov/>.

4 United States Census Bureau. “2020 Census Bureau American Community Survey: S0101: Age and Sex.” <https://data.census.gov/>.

5 United States Census Bureau. “2020 Census Bureau American Community Survey: DP03: Selected Economic Characteristics.” <https://data.census.gov/>.

- **21.5% of workers commuted 30 minutes or more to work.** Fewer workers in the Tri-Basin NRD commuted 30 minutes or more to work than compared to workers commuting less than 15 minutes (21.5% compared to 53.1%).<sup>6</sup>

### Major Employers

Major employers within the NRD include Central Nebraska Public Power District, Allmand Bros, Wardcraft Homes, Royal Engineered Composites, and Embecta. Residents also commute to Lexington and Kearney for employment.

## Housing

Multiple factors inform the vulnerability of housing units to hazard events. Housing age, for example, may indicate which housing units were built prior to the development of state building codes. Older houses and vacant housing generally more vulnerable to hazards if poorly maintained. Additionally, communities with a substantial number of mobile homes may be more vulnerable to the impacts of high winds, tornadoes, and severe thunderstorms if those homes are not anchored correctly. Renters are particularly vulnerable, as renter-occupied housing depends on the initiative of landlords for proper maintenance and retrofitting to be resilient to disasters. Renters are less likely than homeowners to have flood insurance, have ready access to financial resources to evacuate, or to know their risks to flooding and other hazards. The NRD's housing stock has:

- **52.7% of housing built prior to 1970.** The Tri-Basin NRD has a larger share of housing built prior to 1970 than the state (52.7% compared to 45.5%).<sup>7</sup>
- **12.6% of housing units vacant.** The NRD has a higher vacancy rate 12.6% compared to the rest of the state (9.2%).<sup>7</sup>
- **6.8% mobile and manufacture housing.** The Tri-Basin NRD has a larger share of mobile and manufactured housing (6.8%) compared to the state (3.3%).<sup>7</sup>
- **24.1% renter-occupied.** The rental rate of the NRD was 24.1% in 2020. This is lower than the state's rate of 33.8%.<sup>7</sup>

### Broadband Access

Internet or broadband access – through Wi-Fi or cellphone coverage – is a critical means of sharing and receiving information regarding hazardous events, including storm warnings, evacuation orders, or weather updates. Rural communities often lack adequate internet or broadband access. However, internet access is as vital a utility as electricity, as seen through the COVID-19 pandemic when many people worked or attended school from home.

- **83% of households have a broadband internet subscription.** The NRD has a smaller share of households with broadband (83.0%) compared to the state (85.6%).<sup>8</sup>

6 United States Census Bureau. "2020 Census Bureau American Community Survey: S0802: Means of Transportation to Work by Selected Characteristics." <https://data.census.gov/>.

7 United States Census Bureau. "2020 Census Bureau American Community Survey: DP04: Selected Housing Characteristics." <https://data.census.gov/>.

8 United States Census Bureau. "2020 Census Bureau American Community Survey: DP02: Selected Social Characteristics in the United States." <https://data.census.gov/>.

**Governance and Staff**

The NRD is governed by a group of 13 elected Board of Directors and entrusted with a broad range of responsibilities to protect and enhance Nebraska’s many natural resources. The NRD serves both incorporated and unincorporated areas within their district and has the capability to administratively assist villages, cities, and counties with mitigation actions (most commonly flood control and drainage improvements). The following positions may help implement mitigation projects:

- General Manager
- Information and Education Coordinator
- Water Resources Manager
- Land Resources Manager

**Capability Assessment**

The NRD has the authority to levy taxes for specific purposes and to issue general obligation bonds to finance certain projects. The NRD also regularly engages in public education and information programs related to hazard mitigation in the area, and routinely works with other counties, cities, and villages within their jurisdictional boundaries. Due to the unique structure of the NRD, the typical capability assessment table was not used. The following table summarizes the district’s overall capabilities. The NRD does not anticipate adding new or improving existing capabilities in the near future.

District funds are typically sufficient to pursue new capital projects. Tri-Basin NRD has unused levy authority that can be used to fund future projects if needed. Funds have stayed the same over recent years.

**Table NRD.2: Overall Capability**

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

**Plans and Studies**

The Tri-Basin NRD has several documents that discuss or relate to hazard mitigation. Each plan is listed below along with a short description of how it is integrated with the hazard mitigation plan or how it contains hazard mitigation principles. When the NRD updates these planning mechanisms, the local planning team will review the hazard mitigation plan for opportunities to incorporate the goals and objectives, risk and vulnerability data, and mitigation actions into the plan update.

**Basin-Wide Plan for Joint Integrated Water Resources Management of Over Appropriated Portions of the Platte River Basin (2009)**

The Basin-Wide Plan is a cooperative effort by several NRDs located in the over appropriated portion of the Platte River Basin, including North Platte NRD, South Platte NRD, Twin Platte NRD, Tri-Basin NRD, and Central Platte NRD. The purpose of this plan is to meet the requirements for portions of the Platte River Basin that have been designated as over appropriated and achieve the goals and objectives described in *Neb. Rev. Stat. 46-715*. Goals include (1) Incrementally achieve and sustain a fully appropriated condition (2) Prevent reductions in the flow of a river or stream that would cause noncompliance with an interstate compact or decree or other formal

state contract or agreement (3) Keep the plan current (4) Work cooperatively to identify and investigate disputes between groundwater users and surface water appropriators and, if determined appropriate, implement management solutions to address such issues. Also identified are actions that need to be taken to meet those goals. Actions were reviewed for inclusion in the hazard mitigation plan. Due to the age of the document, this has not been integrated with the hazard mitigation plan.

### **Big Blue River Compact (1971)**

While not a plan by the NRD, the Big Blue River Compact has a large impact on the area of the NRD that is in the Little Blue River Basin. The Big Blue River Compact is an agreement between the State of Nebraska and the State of Kansas. The compact requires specific flows at a stream gage near the Nebraska-Kansas state line for each month from May to September. If flows do not meet the set requirement, the Nebraska Department of Natural Resources (NeDNR) can close surface water users that are junior to November 1, 1968.

### **Groundwater Management Plan (2003)**

The groundwater management plan outlines the NRD's response to issues in both groundwater quality and groundwater quantity. Due to the age of the plan, it has not been integrated with the hazard mitigation plan. The plan discusses groundwater supplies within the district, recharge characteristics and rates, crop water needs, groundwater use, and controls to achieve the groundwater reservoir life goal. Due to the age of the document, it has not been integrated with the hazard mitigation plan.

### **Upper Platte Basin Integrated Management Plan (2019)**

This integrated management plan, in cooperation with NeDNR aims to update the goals, objectives, and actions of the 2009 Upper Platte Basin Integrated Management plan. The purpose of the integrated management plan is to work with NRD residents and other to promote good use of water resources within the Upper Platte River Basin. Updated goals are listed below.

1. Reach and Maintain a Fully Appropriated Condition: Incrementally achieve and sustain a fully appropriated condition while maintaining economic viability, social and environmental health, safety, and welfare of the basin.
2. Interstate Compliance: Ensure that no act or omission of the Tri-Basin NRD or NeDNR would cause noncompliance by Nebraska with any interstate decree, compact, or other form a state contract or agreement.
3. Consistency, Communication, and Updates: Keep the integrated management plan current, maintain consistency with the basin-wide plan, and keep water users informed.

Actions identified in the plan include education programs, incentive programs to reduce consumptive water use, water conservation incentive program, drought planning, and studies to be completed. Relevant actions from this plan have been added to this hazard mitigation plan. The plan also gives an overview of the groundwater and surface water regulatory actions the NRD has. The hazard mitigation plan has not been integrated with this integrated management plan.

### **Little Blue Basin Voluntary Integrated Management Plan (2020)**

The purpose of this integrated management plan is to manage hydrologically connected groundwater and surface water within the Little Blue River Basin for the long term. This plan was written in cooperation with NeDNR. Goals within the plan are listed below.

1. Support basin-level water management that transcends political boundaries.

2. Sustain a balance between water uses and supplies through water management strategies and projects.
3. Gain a better understanding of water resources through data acquisition and technical analyses.
4. Improve public understanding of and participation in integrated water management.
5. Monitor progress of plan implementation.

Actions identified in the plan include revising groundwater management rules and triggers, encourage development of projects that will recharge groundwater supplies, work with landowners to encourage best management practices, require flow-meters district-wide, create an education program about groundwater and surface water, and increase data on surface and groundwater within the basin. The plan also gives an overview of the groundwater and surface water regulatory actions the NRD has. Relevant actions and information from this plan have been added to the Hazard Prioritization and Mitigation Strategy sections. The hazard mitigation plan has not been integrated with this planning document.

### **Master Plan (2012)**

The vision of the Tri-Basin NRD is to work cooperatively with district residents to promote good stewardship of land and water resources, which align closely with hazard mitigation. The master plan outlines the areas of responsibility and goals associated with each area. The areas of responsibility and the goals are listed below.

- Soil Conservation and Erosion Control
  - Every acre of land within the NRD will be managed to reduce soil erosion losses to rates that are less than soil loss tolerances defined by the Natural Resources Conservation Service.
- Flood Prevention and Control
  - Develop flood damage prevention programs to protect the resources of the Tri-Basin area.
- Surface and Groundwater Supply and Management
  - All water resources, whether their origin be groundwater or surface water, will be put to beneficial uses, managed efficiently and utilized to preserve their quality and quantity.
- Pollution Control and Waste Disposal
  - Prevent pollution and promote lawful and safe disposal of waste in order to protect natural resources within the Tri-Basin NRD area.
- Drainage Improvement and Channel Rectification
  - Develop drainage systems that reduce damage from storm water and groundwater seepage.
- Recreation, Fish and Wildlife Management
  - Preserve, protect, and enhance wildlife habitat and provide residents of Tri-Basin NRD with fishing, hunting, and recreation opportunities by cooperating with landowners and local, state and federal agencies.
- Forestry and Range Management
  - Improve the quality of all woodland and rangeland in the Tri-Basin area to increase their productivity for livestock and wildlife.

Due to the age of the document, it has not been integrated with the hazard mitigation plan. Information from the Master Plan was used in the Hazard Prioritization section and Location and Geography section.



### **Republican River Basin Integrated Management Plan (2018)**

The purpose of this integrated management plan is to “sustain a balance between water uses and water supplies so that the economic viability, social, and environmental health, safety, and welfare of the Republican River Basin can be achieved and maintain for both the near term and long term”. This plan covers areas within the Tri-Basin NRD that fall within the Republican River Basin and was jointly developed with NeDNR. Goals within the plan are listed below.

6. Maintain Nebraska’s compliance with the Republican River Compact and applicable state laws.
7. Maximize Nebraska’s efficient and beneficial consumptive use of its portion of the water supply, increase certainty for long-range planning of water supplies to reduce the need for regulatory actions, and increase collaborative efforts among water management entities and stakeholders across the basin.
8. Positive public relations, including information sharing, within and outside the basin.
9. When possible, pursue project that not only benefit water supplies and uses, but also create benefits for fish, wildlife, recreation, and conveyance within the Republican River basin.

Actions identified in the plan include education programs, incentive programs to reduce consumptive water use, water banking, riparian vegetation management, encouraging use of conservation best management practices. Relevant actions from this plan have been added to this hazard mitigation plan. The plan also gives an overview of the groundwater and surface water regulatory actions the NRD has. The hazard mitigation plan has not been integrated with this planning document.

### **Republican River Basin-Wide Plan (2019)**

This plan was jointly developed by the Upper Republican NRD, Middle Republican NRD, Lower Republican NRD, and Tri-Basin NRD, and NeDNR. The purpose of the plan is to outline how these entities will collaboratively manage the hydrologically connected water resources within the Republican River Basin. Four goals were identified in the plan and are listed below. Also identified are action items to meet the four goals. Action items were reviewed for including in the hazard mitigation plan. This plan has not been integrated with the hazard mitigation plan.

1. Maintain Nebraska’s compliance with the Republican River Compact and applicable state laws.
2. Maximize Nebraska’s efficient and beneficial consumptive use of its portion of the water supply, increase certainty for long-range planning of water supplies to reduce the need for regulatory actions, and increase collaborative efforts among water management entities and stakeholders across the basin.
3. Positive public relations, including information sharing, within and outside the basin.
4. When possible, pursue projects that not only benefit water supplies and uses, but also create benefits for fish, wildlife, recreation, and conveyance within the Republican River Basin.

### **Republican River Compact (1943)**

While not a plan by the NRD, the Republican River Compact has a large impact on the area of the NRD that is in the Republican River Basin. The Republican River Compact is an agreement between the State of Nebraska, State of Colorado, and the State of Kansas. The compact requires specific flows at stream gages near the Colorado-Nebraska border and the Nebraska-Kansas border. If flows do not meet the set requirement, NeDNR can close surface water uses.

## Rules and Regulations for Management and Protection of Land and Water Resources (2021)

The Rules and Regulations adopted by the Tri-Basin NRD establish procedures for the management practices to conserve and protect groundwater supplies and to prevent the contamination or improper use of groundwater. It also includes rules on erosion and sediment control.

## Future Development Trends

Over the past couple of years, the Tri-Basin NRD has been working with the Platte River Recovery Program to construct a stream flow augmentation well project (eight wells) in northwest Phelps County. The purpose of these wells is to augment Platte River stream flows for endangered species habitat. In the next five years, the NRD anticipates at least constructing eight more wells for the project. No flooding or drainage improvement projects have occurred recently and are not anticipated at this time.

## Community Lifelines

Each participating jurisdiction identified community lifelines that are vital for disaster response and essential for returning the jurisdiction's functions to normal during and after a disaster per the FEMA Community Lifelines guidance. The following subsections list those community lifelines by type, as identified by the local planning team.

### Safety and Security

The Safety and Security Lifeline includes law enforcement, security, fire services, search and rescue, government services, and community safety. The table below lists Safety and Security Lifelines for the NRD.

**Table NRD.3: Safety and Security Lifelines**

CL Number	Name	Generator (G) Shelter (S)	Floodplain (Y/N)
1	Holdrege Armory	-*	N
2	Tri-Basin NRD Office	G	N

*\*The NRD would like to turn the Holdrege Armory into a shelter location.*

### Food, Water, Shelter

Components of this lifeline include food, water, shelter, and agriculture. Food, Water, and Shelter Lifelines for the Tri-Basin NRD are included in the table below. In addition, the local planning team identified the Holdrege municipal water system as a lifeline.

**Table NRD.4: Food, Water, and Shelter Lifelines**

CL Number	Name	Generator (G) Shelter (S)	Floodplain (Y/N)
3	Holdrege Market	-	N
4	Sun Mart	-	N

### Health and Medical

Health and Medical Lifeline components can include medical care, patient transport, public health, fatality management, and the medical supply chain. The following medical and health facilities are critical for the NRD.

**Table NRD.5: Health and Medical Lifelines**

CL Number	Name	Type of Facility	Number of Beds	Generator (G) Shelter (S)	Floodplain (Y/N)
5	Phelps Memorial Health Center	Hospital & Rural Health Clinic	25	G	N

**Energy**

Energy Lifeline components include power, the power grid, and fuel. No energy lifelines were identified by the local planning team.

**Communications**

Components of the Communications Lifeline include communication infrastructure, alerts, 911 dispatch, responder communications, and finance. Communication Lifelines for the NRD are included in the table below.

**Table NRD.6: Communications Lifelines**

CL Number	Name	Generator (G) Shelter (S)	Floodplain (Y/N)
6	KRVN/KUVR	-	N
7	NTV	-	N

**Transportation**

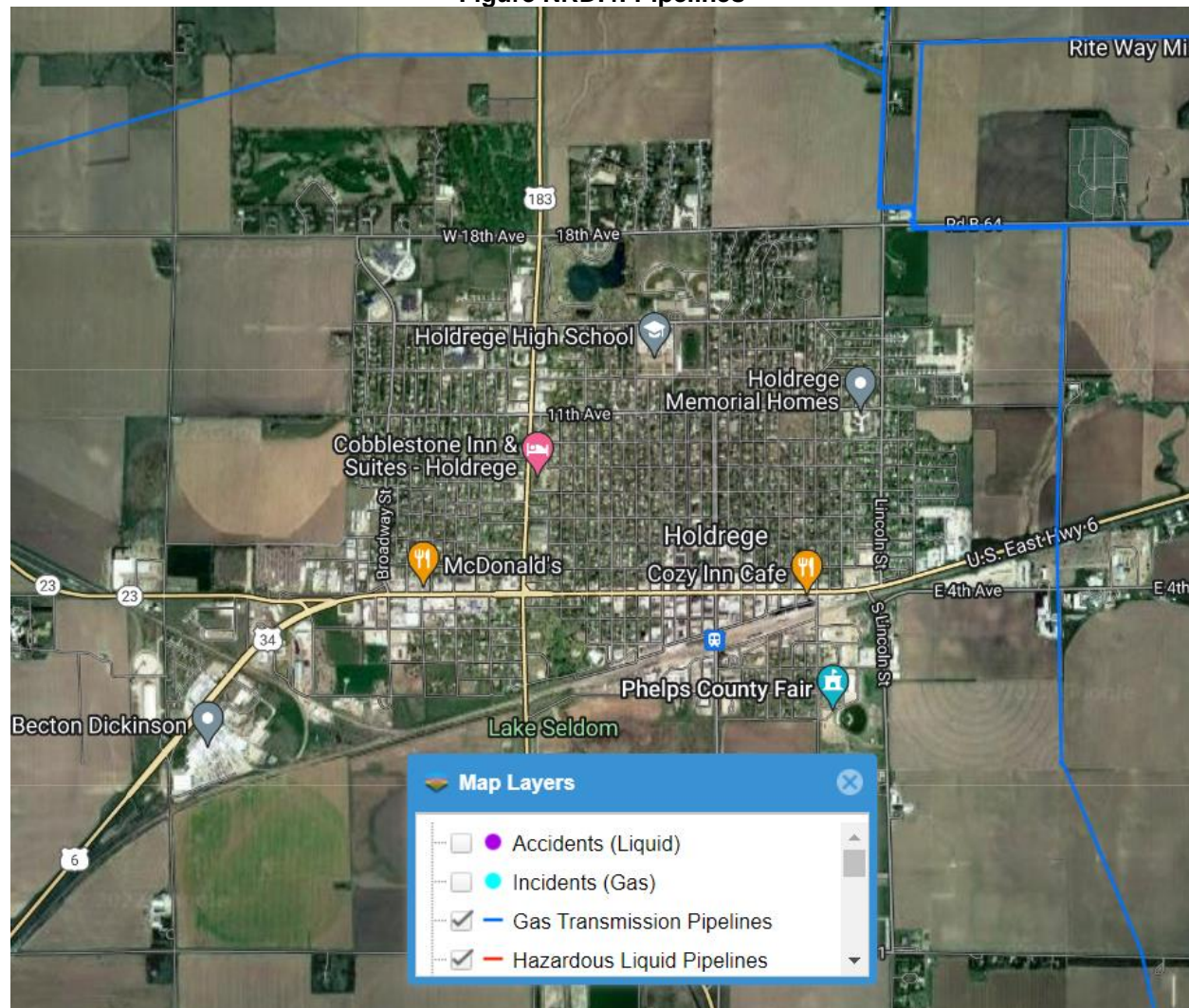
Transportation Lifeline components include interstates, highways, major roadways, mass transit, railway, and aviation. Eight major transportation corridors travel through the NRD: US Highways 6/34, 183, and 283 and Nebraska State Highways 10, 18, 23, 44, and 74. The most traveled route is Highway 6/34 in Holdrege with an average of 10,795 vehicles daily, 680 of which are trucks.<sup>9</sup> A Burlington Northern Santa Fe Railway/Amtrak line and a Nebraska Kansas Colorado line travel through the district. There are six public and private airports throughout the NRD. Transportation information is important to hazard mitigation plans because it suggests possible evacuation corridors in the district, as well as areas more at risk of transportation incidents. No transportation incidents have affected the NRD.

**Hazardous Materials**

The Hazardous Materials Lifeline includes chemical storage facilities, pipelines, and transported chemical tanks. There are several gas transmission pipelines that travel near the NRD office and can be seen in the figure below.

<sup>9</sup> Nebraska Department of Transportation. 2021. "Interactive Statewide Traffic Counts Map." <https://gis.ne.gov/portal/apps/webappviewer/index.html?id=bb00781d6653474d945d51f49e1e7c34>.

Figure NRD.4: Pipelines



Source: National Pipeline Mapping System<sup>10</sup>

According to the Tier II System reports submitted to the Nebraska Department of Environment and Energy, there are 58 chemical sites located within the NRD which house hazardous materials (listed below).<sup>11</sup> A map of those facilities can be found below.

10 National Pipeline Mapping System. 2022. "Public Viewer." Accessed September 2022. <https://pvnpm.phmsa.dot.gov/PublicViewer/>.

11 Nebraska Department of Environment and Energy. "Search Tier II Data." Accessed August 2022.

Figure NRD.5: Fixed Chemical Sites

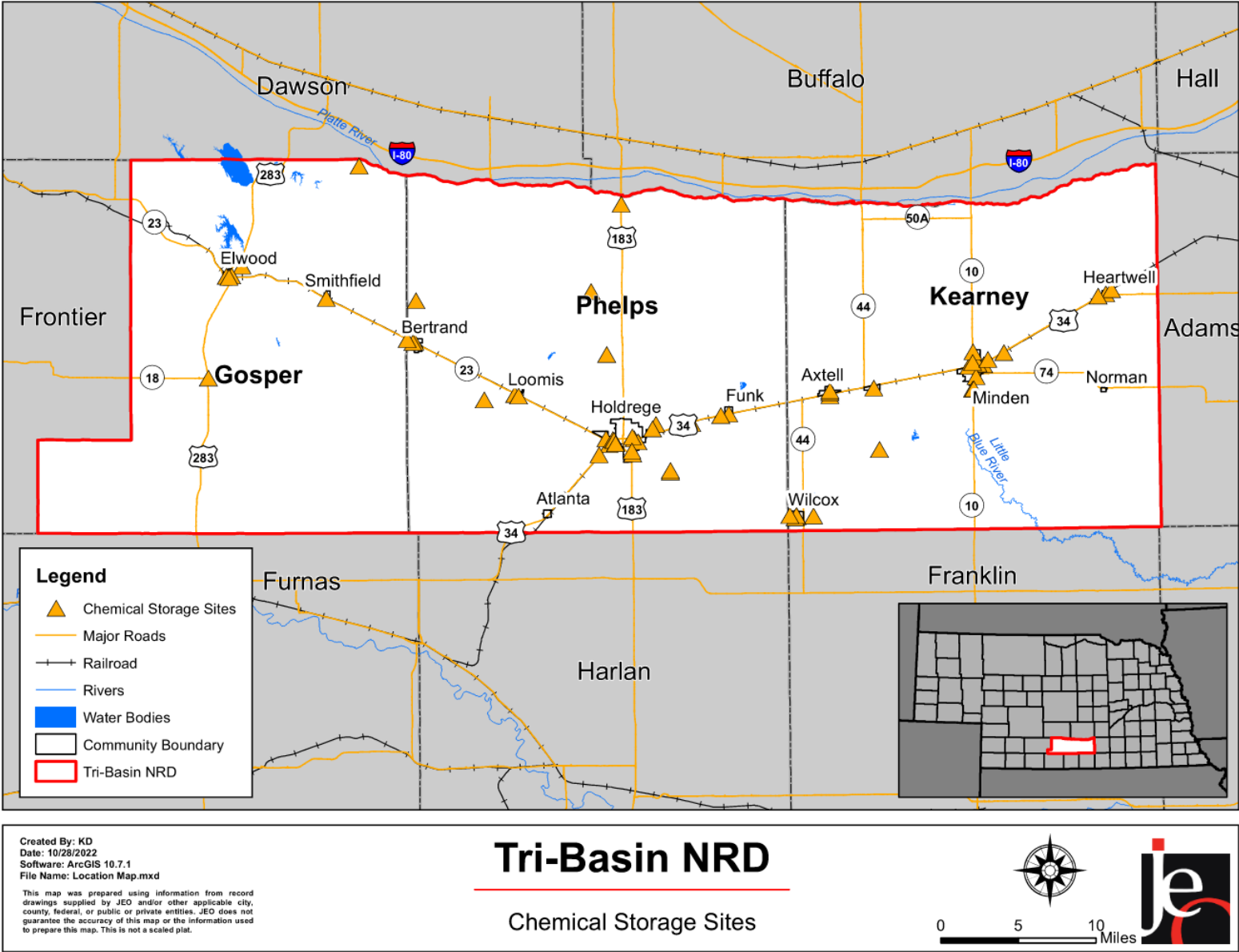
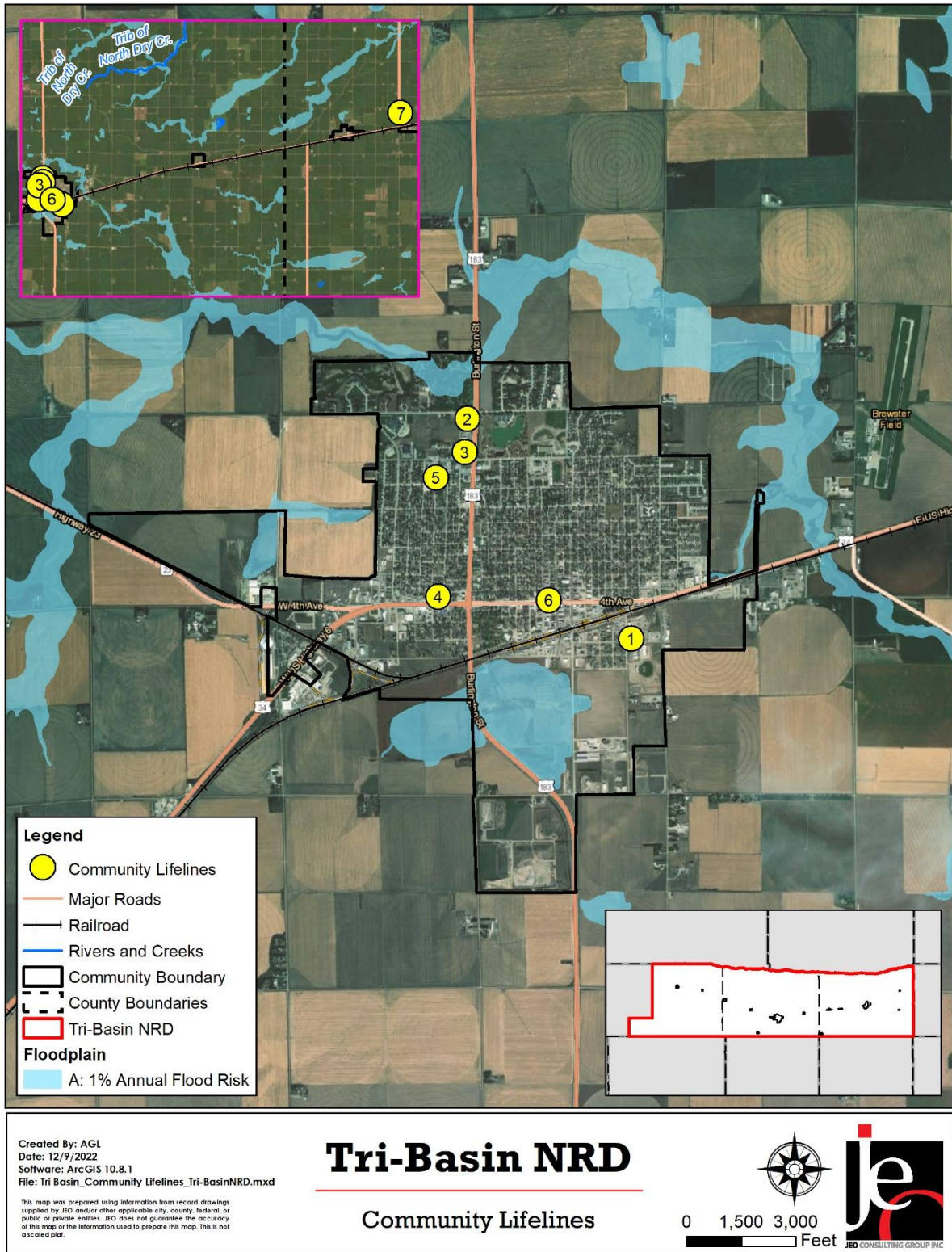


Figure NRD.6: Community Lifelines



## Parcel Improvements and Valuation

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

**Table NRD.7: Parcel Improvements and Value in the Floodplain**

Number of Improvements	Total Improvement Value	Number of Improvements in Floodplain	Value of Improvements in Floodplain	Percentage of Improvements in Floodplain
7,381	\$973,741,221	850	\$144,869,852	11.5%

Source: County Assessors, 2021

## Historical Occurrences

The following table provides a statistical summary for hazards that have occurred in NRD. The property damages from the NCEI Storm Events Database (January 1996 through April 2022) should be considered only as broad estimates. Crop damages reports come from the USDA Risk Management Agency for all three counties between 2000 and 2021.

**Table NRD.8: County Hazard Loss History**

Hazard Type		Count	Property Damage	Crop Damage <sup>2</sup>
<b>Animal &amp; Plant Disease</b>	Animal Disease <sup>1</sup>	20	263 Animals	N/A
	Plant Disease <sup>2</sup>	36	N/A	\$428,696
<b>Dam Failure<sup>5</sup></b>		4	\$0	N/A
<b>Drought<sup>6</sup></b>		489 out of 1,531 Months	\$0	\$46,489,468
<b>Earthquakes<sup>11</sup></b>		0	\$0	\$0
<b>Extreme Heat<sup>7</sup></b>		Avg. 6 Days a Year	N/A	\$7,639,951
<b>Flooding<sup>8</sup></b>	Flash Flood	23	\$6,015,000	\$822,445
	Flood	9	\$93,000	
<b>Grass/Wildfires<sup>9</sup></b> <i>1 Fatality, 2 Injuries</i>		285	\$141,775	\$467,785
<b>Hazardous Materials Release</b>	Fixed Site <sup>3</sup> <i>3 Injuries</i>	60	\$0	N/A
	Transportation <sup>4</sup>	1	\$70,300	N/A
<b>Public Health Emergency</b>		2	N/A	N/A
<b>Severe Thunderstorms<sup>8</sup></b>	Hail Range: 0.75-4.5 in. Average: 1.19 in.	391	\$32,384,000	\$86,181,183
	Thunderstorm Wind Range: 55-96 mph Average: 65.7 mph	245	\$9,076,000	
	Heavy Rain	24	\$20,000	
	Lightning	1	\$500,000	
	Blizzard	30	\$900,000	
<b>Severe Winter Storms<sup>8</sup></b> <i>1 Injury</i>	Extreme Cold/Wind Chill	10	\$0	\$3,098,293
	Heavy Snow	14	\$0	
	Ice Storm	18	\$21,764,000	

Hazard Type		Count	Property Damage	Crop Damage <sup>2</sup>
	Winter Storm	119	\$600,000	
	Winter Weather	116	\$35,000	
<b>Terrorism and Cyber Security<sup>10</sup></b>		0	\$0	N/A
<b>Tornadoes and High Winds<sup>8</sup></b>	High Winds Range: 40-77 mph Average: 57.5 mph 7 Injuries	114	\$3,396,240	\$7,953,707
	Tornadoes Range: EF0-EF2 Average: EF0 4 Injuries	29	\$2,830,000	\$32,779
<b>Total</b>		<b>1,551</b>	<b>\$77,826,315</b>	<b>\$159,430,924</b>

N/A: Data not available  
 1 – NDA, 2014 – 2021  
 2 – USDA RMA, 2000 – 2021  
 3 – NRC, 1990 – July 2022  
 4 – PHSMA, 1971 – July 2022  
 5 – DNR Communication, June 2022

6 – NOAA, 1895 – July 2022  
 7 – High Plains Regional Climate Center, 1897 – 2022  
 8 – NCEI, 1996 - April 2022  
 9 – NFS, 2000 - 2021  
 10 – University of Maryland, 1970 – Aug 2022  
 11 – USGS, 1900 – Aug 2022

## Hazard Prioritization

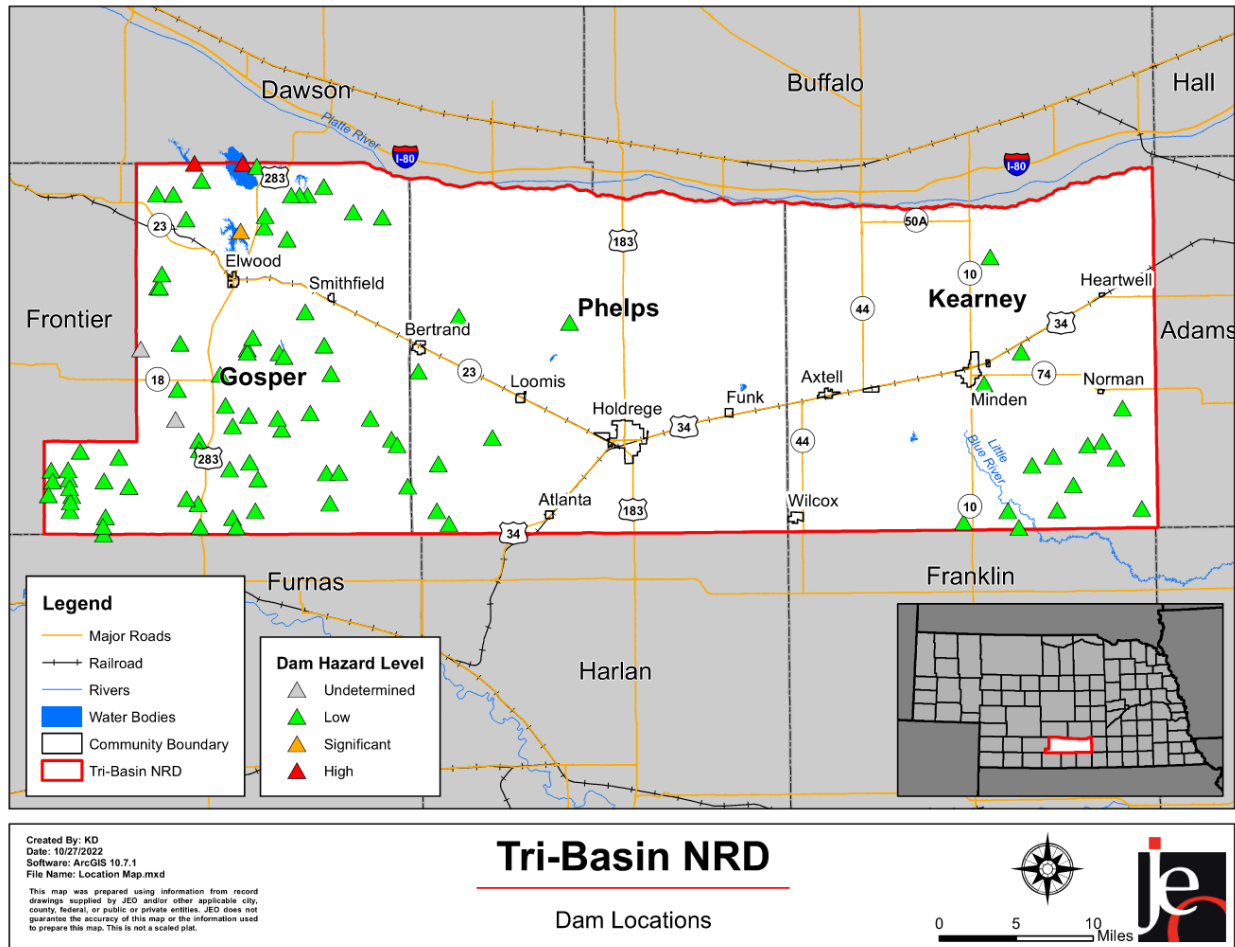
The Tri-Basin NRD Hazard Mitigation Plan evaluates a range of natural and human-caused hazards which pose a risk to the counties, communities, and other participants. However, during the planning process, the local planning team identified specific hazards of top concern for the NRD which required a more nuanced and in-depth discussion of past local events, potential impacts, capabilities, and vulnerabilities. The following section expands on the hazards of top concern identified by the county. Based on this analysis, the local planning team determined their vulnerability to all other hazards to be of low concern. For a review and analysis of other regional hazards, please see *Section Four | Risk Assessment*.

### Dam Failure

While not identified as a top hazard of concern for the local planning team, there are two high hazard dams within the boundaries of the NRD. The Johnson Lake Dam and Johnson Lake West Dike are located in northern Gosper County. If these dams were to fail it would impact the City of Lexington and other downstream communities near the Platte River. According to the Nebraska Department of Natural Resources, there have been four dam failure events in the NRD. However, all were low hazard dams, and no damages were reported. The figure below shows all the dams within the NRD and their hazard classification.



Figure NRD.7: Dam Locations



### Drought

Drought was selected as a top hazard of concern because the local economy within the NRD is dependent on irrigated agriculture. In addition to economic impacts, drought has also caused more wildfires, helped the expansion of invasive Phragmites across the district, caused groundwater declines, and canal water shortages.

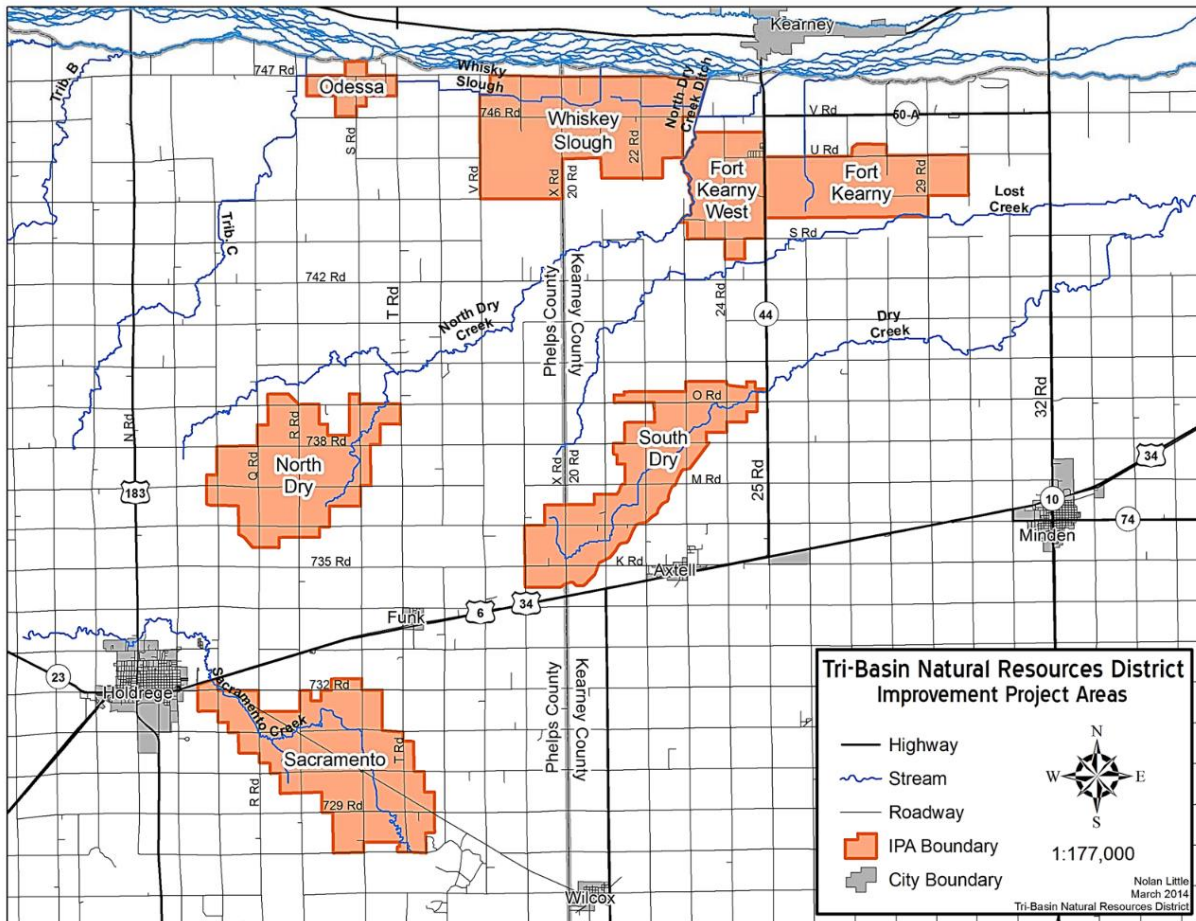
The Republican River Basin and Little Blue River Basin portions of the NRD are subject to the Big Blue River Compact and Republican River Compacts. These compacts specify flow requirements near the Nebraska-Kansas state line. If flows do not meet the requirements, NeDNR can close junior surface water users. During times of drought, surface water irrigators may be impacted in order to keep compliance with either compact.

The Tri-Basin NRD has completed recharge structures in the Little Blue Basin to help with groundwater recharge in the area. In addition, the NRD completed a project to divert excess flows of the Platte River through canals for groundwater recharge. In 2019, the NRD began a Water Conservation Incentive Program to reduce groundwater pumping and increase irrigation water use efficiency. In the future irrigators need to be encouraged to have access to both groundwater and surface water for redundancy.

### Flooding

The most recent large flooding event occurred on July 9<sup>th</sup>, 2019. Heavy rains caused roadway and crop damage in the Platte River Valley and near North Dry Creek. Those two bodies of water are of most concern because they flood regularly. To help reduce the risk of flooding the NRD sprays phragmites and other aquatic weeds to help maintain stream channel capacity. The Tri-Basin NRD also assists landowners in Phelps and Kearney County with surface and groundwater drainage issues. Landowners can request an Improvement Project Area where improvements can be made to culverts and channels. The NRD currently has seven Improvement Project Areas in operation and can be found in the map below. In the future, the NRD will maintain existing drainage projects and expand on phragmites spraying.

Figure NRD.8: Improvement Project Areas



Source: Tri-Basin NRD

### Grass/Wildfires

In April 2022, the NRD experienced the Road 739 Fire in Gosper and Furnas Counties. Nearly 40,000 acres burned including several homes and outbuildings. One individual was killed and two were injured fighting the fire. This hazard was selected by the NRD because of the increasing size and density of Eastern Redcedars in the area. These trees make fighting fires more difficult because they burn so easily and add to the fuel load. To help reduce the risk of wildfires, the NRD is working with landowners to reduce Eastern Redcedar density on rangeland. In the future more fuel management using prescribed burns and mechanical control is needed.

**Hazardous Materials Release**

As the district is tasked with overseeing water quality within their boundaries, a chemical spill is a concern. A large spill can affect surface water and ground water quality for a significant period of time. It is unknown if any chemical spills have impacted water quality within the district but very few large spills have occurred. To help reduce the risk of agricultural chemicals impacting ground water quality, the NRD issues chemigation permits. Inspections of chemigation safety equipment are done once every three years.

**Severe Thunderstorms**

Severe thunderstorms occur frequently across Nebraska and the district. The NCEI recorded 661 severe thunderstorm events since 1996. These events have caused nearly \$42 million in property damages across the NRD. NRD owned buildings and vehicles have been damaged by past hailstorms. The primary concerns related to severe thunderstorms are the potential for crop and property damage. In the event of power loss or a power surge, the NRD backs up important records and uses surge protectors. In addition, power lines to the NRD are buried, which reduces the likelihood of power loss. The Tri-Basin NRD building also has a backup generator in the event of power loss.

**Severe Winter Storms**

Past severe winter storm events have caused power outages to occur across the NRD. Power outages from severe winter storms are a common occurrence. To help reduce the impacts of severe winter storms, drought, and high winds, Tri-Basin NRD has a Windbreak and Windbreak Renovation Cost-Share Program. This program helps reduce the costs to landowners for removing old windbreaks and planting new ones.

**Tornadoes and High Winds**

Tornadoes have the potential to cause catastrophic damages and loss of life. If a tornadic event were to occur in the district, it could have a devastating effect on the local economy. The district is particularly concerned with available shelter access at recreation areas, such as Johnson Lake, Elwood Reservoir, and Fort Kearny State Park. While these recreation areas have warning sirens, they do not have good shelter areas for visitors. The Tri-Basin NRD has recently purchased the old Holdrege Armory Building. If it were renovated, it could be useful as a storm shelter during the county fair and other events at the fairgrounds, due to its proximity.

**Mitigation Strategy**

**Completed Mitigation Actions**

Mitigation Action	Tornado Safety
Description	Implement a tornado safety program.
Hazard(s) Addressed	Tornadoes and High Winds
Status	Completed

### New Mitigation Actions

Mitigation Action	Drought Plan
Description	Create a drought plan for the entire NRD as identified in the Upper Platte Basin Integrated Management Plan.
Hazard(s) Addressed	Drought
Estimated Cost	\$40,000+
Local Funding	General Fund
Timeline	5+ Years
Priority	Low
Lead Agency	General Manager, NRD Board
Status	Not Started. The NRD does not have the capability to implement this project due to a lack of funds.

Mitigation Action	Drought Planning Exercise
Description	Organize and participate in a basin-wide drought planning exercise as identified in the Republican River Basin-Wide Plan.
Hazard(s) Addressed	Drought
Estimated Cost	Staff Time
Local Funding	Staff Time
Timeline	2-5 Years
Priority	Low
Lead Agency	General Manager
Status	Not Started. The NRD has the capability to implement this project.

Mitigation Action	Ice Jam Monitoring Camera/Station
Description	Currently the NRD has to send an employee to physically check ice jams on the Platte River. Tri-Basin NRD would like to purchase a monitoring camera that can be placed at a bridge to provide continuous monitoring by video of the Platte River.
Hazard(s) Addressed	Flooding, Severe Winter Storms
Estimated Cost	Unknown
Local Funding	General Fund
Timeline	2-5 Years
Priority	Medium
Lead Agency	General Manager
Status	Not Started. The NRD has the capability to implement this project.

Mitigation Action	Invasive Species Management
Description	Manage and remove invasive riparian species like phragmites in affected rivers and creeks as identified in the Republican River Basin Integrated Management Plan.
Hazard(s) Addressed	Flooding
Estimated Cost	\$10,000
Local Funding	General Fund
Timeline	Ongoing
Priority	Medium
Lead Agency	Land Resources Coordinator
Status	Ongoing

Mitigation Action	Reduce Groundwater and Surface Water Use
Description	Create incentive programs to reduce consumptive water use and water conservation as identified in the Upper Platte Basin Integrated Management Plan and Republican River Basin Integrated Management Plan. Work with individual groundwater and surface water irrigations to improve efficiency of delivery systems as identified in the Republican River Basin-Wide Plan.
Hazard(s) Addressed	Drought
Estimated Cost	Staff Time
Local Funding	Staff Time
Timeline	5+ Years
Priority	Low
Lead Agency	Land Resources Coordinator
Status	Not Started. The NRD has the capability to implement this project.

Mitigation Action	Safe Room and Storm Shelters
Description	Construct a new building or renovate an existing building to be used as a community safe room or storm shelter. Currently the NRD owns the Holdrege Armory Building that could be renovated and used as a safe room or storm shelter.
Hazard(s) Addressed	Severe Thunderstorms, Tornadoes and High Winds
Estimated Cost	Unknown
Local Funding	General Fund
Timeline	2-5 Years
Priority	High
Lead Agency	General Manager, NRD Board
Status	Not Started. The NRD does not currently have the capability to implement this project due to a lack of funds.

**Kept Mitigation Actions**

Mitigation Action	Backup Generators
Description	Provide a portable or stationary source of backup power to NRD owned buildings. A generator is needed for the Holdrege Armory.
Hazard(s) Addressed	Extreme Heat, Flooding, Grass/Wildfires, Severe Thunderstorms, Severe Winter Storms, Tornadoes and High Winds
Estimated Cost	\$20,000+
Local Funding	General Fund
Timeline	2-5 Years
Priority	High
Lead Agency	General Manager, NRD Board
Status	Not Started

Mitigation Action	Forestry Management
Description	Continue the forestry management activities of the district. This may include cost share programs and assisting with the identification and removal of hazardous trees and/or limbs.
Hazard(s) Addressed	Grass/Wildfire, Severe Thunderstorms, Severe Winter Storms, Tornadoes and High Winds
Estimated Cost	\$3,000+
Local Funding	General Fund
Timeline	5+ Years
Priority	Low
Lead Agency	Land Resources Coordinator
Status	Not Started. Cost-share funds are needed to do additional wood vegetation management.

Mitigation Action	Groundwater Recharge
Description	Utilize structures such as oxbow reconnection, in-stream weirs, etc. to facilitate groundwater recharge in times of excess surface water flows. These structures would provide secondary benefits such as grade control, streambank stabilization, and habitat enhancements.
Hazard(s) Addressed	Drought, Flooding
Estimated Cost	\$100,000+
Local Funding	General Fund, Special Assessments
Timeline	2-5 Years
Priority	High
Lead Agency	Land Resources Coordinator
Status	Planning Stage. The NRD is currently looking for additional cooperators for additional recharge sites.

Mitigation Action	Infrastructure Hardening
Description	Harden NRD buildings to withstand high winds, hail, heavy snow, etc. by hardening roofs, hail resistant barriers to HVAC systems, shatter-proofing windows, building tie-downs and anchors, and other architectural designs that reduce damage.
Hazard(s) Addressed	Severe Thunderstorms, Severe Winter Storms, Tornadoes and High Winds
Estimated Cost	\$10,000+
Local Funding	General Fund
Timeline	Ongoing
Priority	Medium
Lead Agency	General Manager, NRD Board
Status	Ongoing

Mitigation Action	Public Awareness/Education
Description	Outreach projects, distribution of maps, and environmental education increase public awareness of natural hazards. Other examples include educating citizens on water conservation methods, evacuation plans, etc. In addition, purchasing equipment such as overhead projectors and laptops to facilitate presentation of information.
Hazard(s) Addressed	All Hazards
Estimated Cost	\$3,000+, Staff Time
Local Funding	General Fund, Staff Time
Timeline	Ongoing
Priority	Low
Lead Agency	Information and Education Coordinator
Status	Ongoing

Mitigation Action	<b>Stormwater System and Drainage Improvements</b>
Description	Improve stormwater drainage throughout the district. This may include, but is not limited to ditch upsizing, ditch cleanouts, culvert improvements, retention facilities, and detention facilities.
Hazard(s) Addressed	Flooding
Estimated Cost	\$10,000+
Local Funding	General Fund, Special Assessments
Timeline	Ongoing
Priority	High
Lead Agency	Land Resources Coordinator
Status	Ongoing. Improvements are made as issues are identified and funding is available.

Mitigation Action	<b>Stream Bank Stabilization</b>
Description	Stabilize banks along streams and rivers. This may include, but is not limited to reducing bank slope, addition of riprap, and installation of erosion control materials/fabrics.
Hazard(s) Addressed	Flooding
Estimated Cost	\$10,000+
Local Funding	General Fund
Timeline	Ongoing
Priority	Medium
Lead Agency	Land Resources Coordinator
Status	Ongoing. Stabilization is done as issues are identified and funding is available.

Mitigation Action	<b>Windbreaks/Living Snow Fence</b>
Description	Utilize the Windbreak Renovation Cost-Share to assist residents with the installation of windbreaks throughout the district.
Hazard(s) Addressed	Drought, Severe Thunderstorms, Severe Winter Storms, Tornadoes and High Winds
Estimated Cost	\$20,000
Local Funding	General Fund
Timeline	Ongoing
Priority	Medium
Lead Agency	Land Resources Coordinator
Status	The cost share program is an ongoing effort of the NRD to reduce soil erosion throughout the district.

**Removed Mitigation Actions**

Mitigation Action	<b>Develop Dam Failure Emergency Action and Evacuation Plans</b>
Description	Work with officials to develop emergency action and evacuation plans if a dam were to fail.
Hazard(s) Addressed	Dam Failure
Status	Removed. This action is no longer a priority for the NRD.

Mitigation Action	<b>Emergency Exercise: Dam Failure</b>
Description	Conduct a tabletop exercise to determine the response scenarios in the event of dam failure.
Hazard(s) Addressed	Dam Failure
Status	Removed. This action is no longer a priority for the NRD.

## Plan Maintenance

Hazard Mitigation Plans should be living documents and updated regularly to ensure effectiveness and reflect changes in hazard events, priorities, and mitigation actions. These updates are encouraged to occur after every major disaster event, alongside district planning documents (e.g., annual budget, master plan, etc.), during the fall before the HMA grant cycle begins, and/or prior to other funding opportunity cycles begin including CDBG, Water Sustainability Fund, Revolving State Fund, or other identified funding mechanisms.

The General Manager will be responsible for reviewing and updating this NRD profile outside of the five-year update. The Tri-Basin NRD will review the plan annually and the public will be notified using social media and NRD board meetings.