Santee Sioux Nation
Tribal Hazard Mitigation Plan
November 2023

MORRISON
Planning and Consulting

Executive Summary

This 2023 Local Hazard Mitigation Plan (THMP) serves as the first THMP for the SSN. The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. The Tribe prepared this THMP in order to make the Tribe and its residents less vulnerable to future hazard events.

This THMP demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This THMP was also developed, among other things, to make the Tribe eligible for certain pre- and post-mitigation grant funding: specifically, the FEMA Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities (BRIC) Program, and the Flood Mitigation Assistance Program (FMA).

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated. The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards.

THMP Plan Development Process

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This THMP documents the hazard mitigation planning process and identifies relevant hazards, risks and vulnerabilities, and strategies the Tribe will use to decrease vulnerability and increase resiliency and sustainability in the community.

This THMP was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390), the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.7) and finalized on October 31, 2007, and the latest FEMA THMP guidance effective April 2023. The Tribe followed a planning process prescribed by FEMA as detailed in Table ES-1.

Table ES-1 Local Hazard Mitigation Planning Process

DMA Process	Modified CRS Process
1) Organize Resources	
201.7(c)(1)	1) Organize the Planning Effort
201.7(b)(1)	2) Involve the Public

DMA Process	Modified CRS Process
201.7(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.7(c)(2)(i)	4) Identify the Hazards
201.7(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.7(c)(3)(i)	6) Set Goals
201.7(c)(3)(ii)	7) Review Possible Activities
201.7(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.7(c)(5)	9) Adopt the Plan
201.7(c)(4)	10) Implement, Evaluate, and Revise the Plan

The planning process began with the organizational phase to establish the Tribal Hazard Mitigation Planning Committee (THMPC) comprised of key Tribal representatives, and other local and regional stakeholders; to involve the public; and to coordinate with other departments and agencies. A detailed risk assessment was then conducted followed by the development of a focused mitigation strategy for the SSN. Once approved by FEMA, this THMP will be adopted and implemented by the Tribe over the next five years.

Risk Assessment

A risk assessment was conducted that identified and profiled hazards that pose a risk to the Tribe, assessed the vulnerability of the SSN to these hazards, and examined the existing capabilities to mitigate them.

The SSN is vulnerable to numerous hazards that are identified, profiled, and analyzed in this Plan. Floods, drought, levee failures, landslides, wildfires, and other severe weather events are among the hazards that can have a significant impact on the Tribe. Table ES-2 details the hazards identified for this SSN THMP.

Table ES-2 SSN Hazard Identification Assessment

Hazard*	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Dam Failure	Extensive	Unlikely	Critical	Low	Medium
Drought and Water Shortage	Extensive	Likely	Negligible	Medium	High
Flood: 1%/0.2% annual chance	Significant	Unlikely	Limited	Medium	High
Hazardous Materials: Transportation	Significant	Occasional	Limited	Low	Low
Landslide	Limited	Likely	Limited	Medium	Medium
Pandemic	Extensive	Occasional	Critical	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rain and Storms	Extensive	Highly Likely	Limited	High	High
Severe Weather: High Wind and Tornado	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Winter Storms	Extensive	Highly Likely	Critical	High	Low
Wildfire	Extensive	Highly Likely	Catastrophic	High	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Probability of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Climate Change Influence
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Mitigation Strategy

Based on the results of the risk assessment, the Tribe in conjunction with the THMPC developed a mitigation strategy for reducing the Tribe's risk and vulnerability to hazards. The resulting Mitigation Strategy for the SSN is comprised of THMP goals and objectives and a mitigation action plan which includes a series of mitigation action projects and implementation measures. Based on the risk assessment, the HMPC identified goals and objectives for reducing the SSN's vulnerability to hazards. The goals and objectives of this multi-hazard mitigation plan are:

- Goal 1: Protect Health and Safety of Residents
- Goal 2: Reduce Future Losses from Hazard Events
- Goal 3: Increase Public Awareness and Education on Vulnerability to Hazards
- Goal 4: Improve Emergency Management Capabilities

Actions to support these goals are shown on Table ES-3.

Table ES-3 SSN Planning Area Mitigation Actions

Action Title	Address Current Development	Address Future Development	Mitigation Type
Multi-Hazard Actions			
Public outreach and education (for natural hazards)	X	X	Public Information
Public Outreach and Education (for Public Health Emergencies)	X	X	Public Information
Hire Emergency Manager (Complete management plan)	X	X	Emergency Services
Mass Notifications	X	X	Emergency Services Public Information
Identify Vulnerable Populations	X	X	Emergency Services
Create GIS database	X	X	Emergency Services
3 Phase Tie Line from Niobrara to Santee	X	X	Structural
Early Warning Systems	X	X	Emergency Services Structural
Update EOP	X	X	Emergency Services Public Information
Safe Rooms and Shelters	X	X	Public Information Structural
Explore Relationships with Other Mitigation Partners	X	X	Emergency Services Public Information
Explore Green Energy Plan/Alternatives	X	X	Property Protection Natural Resource Protection
Undergrounding Utilities	X	X	Structural
Resilient Housing Stock	X	X	Structural
Drought and Water Shortage Actions			
Continue Monitoring Wells	X	X	Natural Resource Protection

Action Title	Address Current Development	Address Future Development	Mitigation Type
Water System	X	X	Structural
Drought Planning			Property Protection Natural Resource Protection
Flood Actions			
Update Flood Management Plan	X	X	Property Protection Natural Resource Protection
Explore NFIP	X	X	Prevention
Culvert Cleaning	X	X	Property Protection Natural Resource Protection
Landslide Actions			
Protect Water Lines from Future Landslides			Property Protection
Severe Weather Actions			
Generator Backups	X	X	Emergency Services Property Protection
Explore Areas for Cooling Centers	X	X	Emergency Services
Wildfire			
Seek to Complete Actions in the Most Recent Fire Plan	X	X	Property Protection Natural Resource Protection

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Abbreviations and Acronyms

Acronym	Definition
AQI	Air Quality Index
ASCE	American Society of Civil Engineers
ATSDR	Agency for Toxic Substances and Disease Registry
BIA	US Bureau of Indian Affairs
BRIC	Building Resilient Infrastructure and Communities
CDC	Center for Disease Control
CDC SVI	CDC Social Vulnerability Index
CEO	Chief Executive Officer
CRS	Community Rating System
CRV	Content Replacement Values
DMA	Disaster Mitigation Act
DFIRM	Digital Flood Insurance Map
EF	Enhanced Fujita Scale
EHS	Extremely Hazardous Substances
EPA	Environmental Protection Agency
F	Fahrenheit
F	Fujita Scale
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
GIS	Geographic Information Systems
GRASP	Geospatial Research, Analysis & Services Program
HHPD	High Hazard Potential Dam
HMGP	Hazard Mitigation Grant Program
HUD	US Housing and Urban Development
LOMA	Letter of Map Amendment
LOMC	Letter of Map Revision
LOMR	Letter of Map Correction
MERS	Middle East Respiratory Syndrome
NCDC	National Climatic Data Center
NCDHD	North Central District Health Department
NDMC	National Drought Mitigation Center
NIDIS	National Integrated Drought Information System
NOAA	National Oceanic and Atmospheric Administration

Acronym	Definition
NeDNR	Nebraska Department of Natural Resources
NEMA	Nebraska Emergency Management Agency
NFIP	National Flood Insurance Program
NWS	National Weather Service
OSHA	U.S. Occupational Safety and Health Administration
PDM	Pre-Disaster Mitigation
PDSI	Palmer Drought Severity Index
PHMSA	Pipeline and Hazardous Materials Safety Administration
RCP	Representative Concentration Pathway
SARS	Severe Acute Respiratory Syndrome
SBA	Small Business Administration
SPP	Southwest Power Pool
SRL	Severe Repetitive Loss
SSN	Santee Sioux Nation
THMP	Tribal Hazard Mitigation Plan
THMPC	Tribal Hazard Mitigation Planning Committee
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
WHO	World Health Organization
WUI	Wildland-Urban Interface

Chapter 1 Introduction

1.1 Purpose

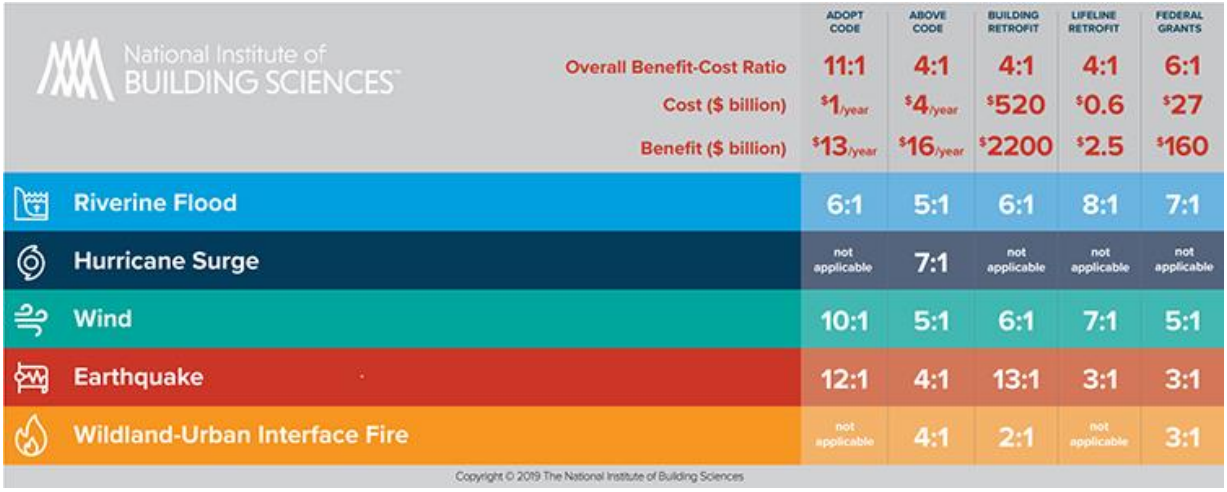
The Santee Sioux Nation prepared this 2023 Tribal Hazard Mitigation Plan (THMP) to guide hazard mitigation planning to better protect the people and property of the Tribe from the effects of hazard events. This THMP demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This THMP was also developed so the Tribe can be eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program.

1.2 Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $6 in avoided future losses in addition to saving lives and preventing injuries (see Figure 1-1).

Figure 1-1 Natural Hazard Mitigation Savings by Hazard Type and Mitigation Type



Source: National Institute of Building Science Multi-Hazard Mitigation Council 2019 Interim Report

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This THMP documents the Tribe's hazard mitigation planning process and identifies relevant hazards, vulnerabilities, and mitigation strategies the Tribe will use to decrease vulnerability and increase resiliency and sustainability in the community.

This Santee Sioux Nation THMP is a single jurisdictional plan that geographically covers the entire area within the Tribe's jurisdictional boundaries (i.e., the Planning Area). This Plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.) This planning effort also follows FEMA's most current Plan Preparation and Review Guidance. While the DMA 2000 emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because the Tribe is subject to many kinds of hazards, access to these programs is vital.

Information in this THMP will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. Placentia has been affected by hazards in the past and is thus committed to reducing future impacts from hazard events and becoming eligible for mitigation-related federal funding.

1.3 Plan Organization

The Santee Sioux Nation's Tribal Hazard Mitigation Plan is organized as follows:

Chapters

- Chapter 1: Introduction
- Chapter 2: Community Profile
- Chapter 3: Planning Process
- Chapter 4: Risk Assessment
- Chapter 5: Mitigation Strategy
- Chapter 6: Plan Adoption
- Chapter 7: Plan Implementation and Maintenance

Appendices

- Appendix A: Planning Process
- Appendix B: References
- Appendix C: Mitigation Strategy
- Appendix D: Adoption Resolution

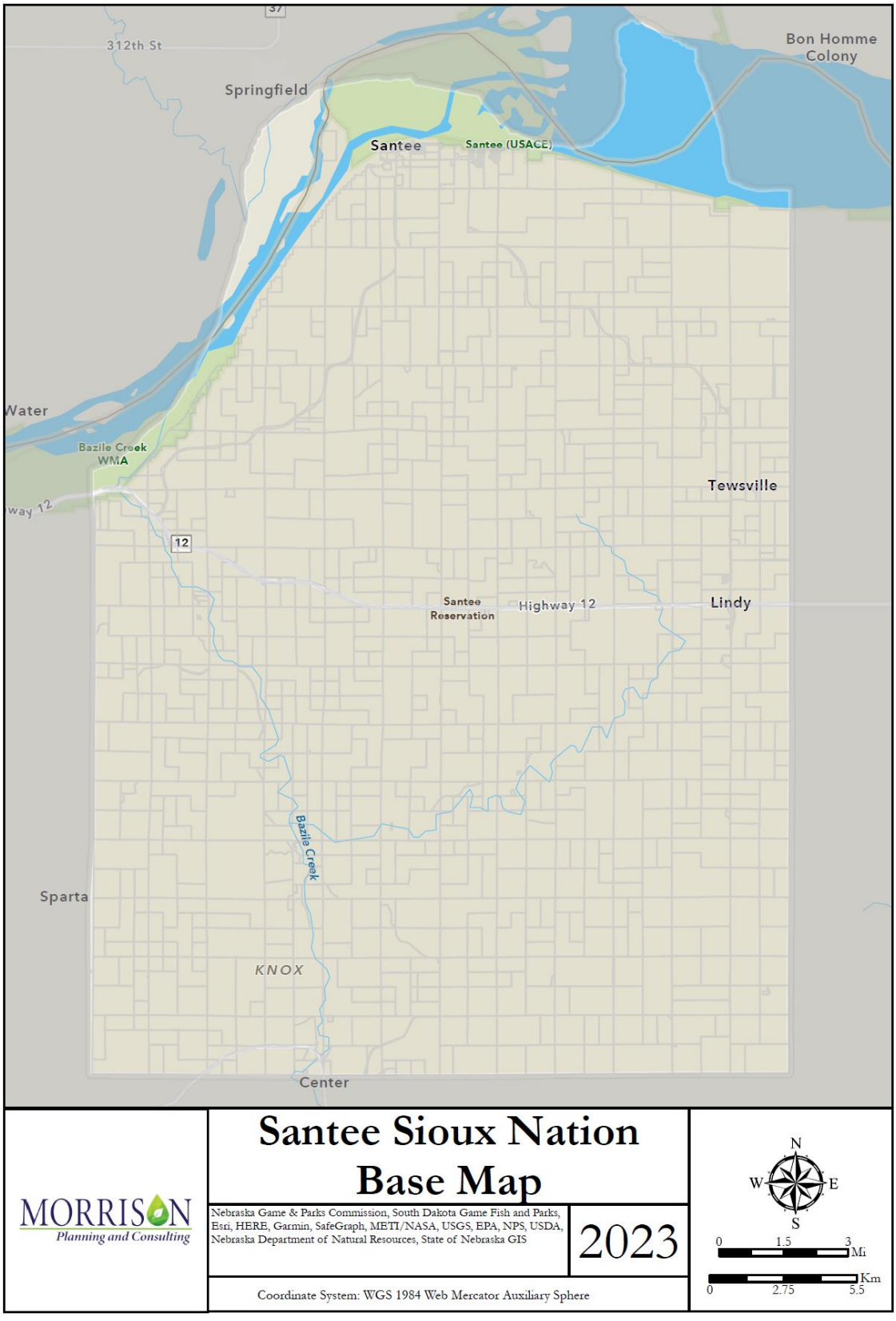
Chapter 2 Community Profile

2.1 Santee Sioux Nation Overview

The Santee Sioux Nation originated in a large swath of Midwest territory, from Minnesota to Montana down to northern Nebraska. The tribe was moved multiple times due to contention between the native people and the settlers that began establishing themselves on their land, but eventually landed in Knox County on the reservation of tribal land. The Santee Nation is comprised of four bands of people groups, the Mdewakantonwan, Wahpeton, Sissetons and the Wahpekute. The tribe has seen a drastic decrease in its numbers in recent years past but has begun to see a slow increase as individuals move back to the tribe or live away from the reservation but choose to be registered regardless. The reservation currently (since the 2020 census) has 904 tribal members living within its borders.

The Tribal land can be seen on Figure 2-1 below.

Figure 2-1 Santee Sioux Reservation



2.2 History

The Santee were the "frontier guardians of the Sioux Nation," that ranged from the Santee's home in what is currently Minnesota, across the Plains and to the northern Rocky Mountains in Montana and south through the northwestern part of Nebraska. Four bands comprised the Santee division of the Sioux Nation, the Mdewakantonwan, Wahpeton, Sissetons and the Wahpekute. The Santee were a woodlands tribe, living in semi-permanent villages and engaging in some farming. They originally lived in the north central part of Minnesota, but the Santee's defeat by the Chippewas at the Battle of Kathio in the late 1700s forced them to move to the southern half of the state.

The first treaty between the Santee and the government was signed in 1805, ceding one thousand acres of Santee land in exchange for $2,000. Fort Snelling, built in 1819, allowed further white settlement contrary to treaty specifications. The 1837 treaty authorized the Santee cession of all their land east of the Mississippi River. Lands west of the Mississippi were to be allotted exclusively for the Santee. Altogether, the Santee gave up 35 million acres, the "garden spot of the Mississippi Valley." This treaty also designated a tract of land in southwest Minnesota for the Santee's reservation. Following the treaty negotiations, Congress failed to appropriate the money for the annuity payments due to the tribe, and the government didn't provide the agricultural supplies and implements promised in the treaty. With the absence of game, insufficient means to raise adequate crops, and lack of annuity payments to purchase food and supplies from agency traders, the tribe faced eventual starvation. These factors contributed to the paranoia and mistrust felt by both sides as isolated outbreaks of violence occurred between the settlers and renegade bands of the tribe.

These factors led to the events which triggered the Santee Uprising of 1862. An argument developed between two young Santee men over the courage to steal eggs from a white farmer. The test for courage became a dare to kill, ending in the killing of three white men and two women. Santee leaders, Little Crow, Medicine Bottle, Shakopee, and Big Eagle debated whether to take the offensive against the "bluecoats." The young men, hungry and cynical, eventually convinced their disillusioned leaders that their fate was inevitable. However, not all Santee participated in the uprising and many of those that did helped white people escape their people's vengeance.

Events following the surrender of the Santee and the release of their white captives permanently stained American history. Colonel Henry Sibley, commander of the U.S. troops in Minnesota, imprisoned 1,800 Santee. Many had surrendered believing that they would receive just, and fair treatment as promised by the Colonel. However, an Army commission was formed to prosecute the Santee "conspirators," who were denied access to legal counsel. Consequently, over three hundred Santee were sentenced to death. Protest by a handful of concerned missionaries and individuals brought the matter to President Lincoln's attention, who reviewed the cases and commuted all but thirty-nine sentences. One additional Santee was granted a reprieve before the scheduled execution. In December of 1862, thirty-eight Santee were executed in Mankato, Minnesota which is the largest mass execution ever carried out by the U.S. government.

Following this, a reservation site in South Dakota called Crow Creek was selected for the Santee. Two thousand Santee refugees were herded on boats and shipped upstream to this new home. The tribe suffered over 300 deaths during the first months at Crow Creek, mostly due to disease and undernourishment. Recognizing the unfeasibility of making Crow Creek a permanent reservation site, a reserve in northeastern Nebraska along the Missouri River was finally chosen, and the Santee again moved to a new home in what

is presently Knox County. The reservation originally consisted of 115,075 acres. Later, in part through the Dawes Severalty Act of 1887, the land was allotted, which significantly reduced the tribe's total acreage.

Today, the Santee Sioux Reservation encompasses an area of roughly 9,449 acres. The reservation is bordered on the north by the Missouri River and stretches approximately 17 miles to the south and is 13 miles from east to west. The village of Santee is in the northwestern area of the reservation and borders the river. The Santee Normal Training School, established by missionaries in 1870, greatly influenced the development of the tribe during the latter decades of the 19th century. In 1936 the school closed because of insufficient funding.

Despite severe punishment from the US Government and removal from their traditional homelands in 1862, the Santee Sioux nation continues to strive toward self-determination through economic development and education. The Santee Public School District and the Nebraska Indian Community College provide schooling for the younger members of the population. The Santee Sioux Nation is a federally recognized tribe organized in accordance with the Indian Reorganization Act of 1934 (as amended in 1935). The tribe adopted a constitution and bylaws in 1936 and operated under the constitution with an elected tribal council. The reservation was organized into four districts (Santee, Hobu Creek, Bazile Creek, and Howe Creek) each had three members. Members were elected for three years in staggered terms and annually, one member from each district was elected and the council organized from within. In 2002 the constitution was amended, and the council was reduced to eight members consisting of a Chairman, Vice Chairman, Secretary and Treasurer. Each of the 4 districts has one member. Annually one officer and one district representative are elected for four years, and the council terms are staggered in order to maintain stability. The Tribal Council governs under the authority of the Santee Sioux Nation constitution with the powers authorized. The preamble of the Nation's constitution is guiding light of the Council's actions.

While there have been multiple disasters that have affected the Santee Nation, there are some recent events that have caused significant damage. In March 12-14, 2019, the Santee Reservation was severely impacted by flooding caused by a storm that produced extreme precipitation in Nebraska and the surrounding states. However, the flooding was caused not only by the storm system but also by prior weather and surface conditions. Much of the area still had frozen soils and rivers and had above-average streamflow conditions due to large amounts of precipitation in the prior weeks. Rising temperatures associated with the storm also contributed to the extreme flooding by melting snow and ice. In the Fourth National Climate Assessment (NCA), the Northern Great Plains was predicted to have an increase in the number of heavy precipitation events (more than one inch per day) due to climate change. The 2019 flood, for now, is just an extreme weather event, but if these events occur more frequently, the flood's effects serve as an alarm for climate change's impacts that might appear more in the U.S.

The extreme flooding during the storm caused the failure of different types of infrastructure, one of which impacted the SSN—the Spencer Dam failure on March 14. The failure was caused by immense amounts of ice building up on the Niobrara, which was broken up during the storm and eventually caused the dam to give way. This failure on the Niobrara River triggered catastrophic flooding and further impacted the town of Santee since it was already suffering from the flooding of the Missouri River. This combination of the Niobrara and Missouri Rivers flooding caused power outages and damaged homes and roads. Of most concern was the town not having access to potable water for several weeks.

This, along with several other hazards that affect the tribe yearly, are some of the reasons why mitigation tactics will benefit the long-term health of the tribe and the individuals who live within its borders.

2.3 Geography and Climate

Santee Sioux Nation is classified as a continental climate, with warm temperatures in the summer and cold in the winter. The average annual temperature for the Tribe is 59°F degrees and there is a typical rainfall of 34.3 inches in a year. It is dry for 186 days a year with an average humidity of 73% and UV-index of 3. The highest average temperature in Santee is 87.8°F in July and the lowest is 26.6°F in January.

2.4 Population and Socioeconomic Makeup

Select social and economic information for the City is shown in Table 2-1.

Table 2-1 SSN – Select Social and Economic Statistics

Statistic	Number
Populations	
Population under 5	13.4%
Population over 65	10.0%
Median Age	23.4
Racial Makeup	
White	1.9%
Black or African American	0.0%
American Indian or Alaska Native	90.8%
Asian	0.9%
Native Hawaiian or Pacific Islander	0.1%
Other Races	0.0%
Two or more races	6.1%
Income and Poverty	
Median income	$23,250
Poverty Rate – All people	20.3%

Source: 2021 US Census American Community Survey,

Chapter 3 Planning Process

Requirements §201.7(b) and §201.7(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

The Santee Sioux Nation (SSN) recognized the importance and need of a Tribal Hazard Mitigation Plan (THMP) and initiated its development. After identifying SSN tribal funds, which served as the funding source for this Plan, the Tribe contracted with Morrison Planning and Consulting (Morrison Planning) to facilitate and develop this THMP. Chris Morrison, a professional planner with Morrison Planning, was the project manager in charge of overseeing the planning process and the development of this THMP. The Morrison Planning team's role was to:

- Assist in establishing the Tribal Hazard Mitigation Planning Committee (THMPC) as defined by the Disaster Mitigation Act (DMA);
- Meet the DMA requirements as established by federal regulations and following FEMA's planning guidance;
- Support objectives under the National Flood Insurance Program's (NFIP) and the Flood Mitigation Assistance (FMA) program;
- Facilitate the entire planning process;
- Identify the data requirements that THMPC participants could provide and conduct the research and documentation necessary to augment that data;
- Assist in facilitating the public input process;
- Produce the draft and final plan documents; and
- Coordinate with FEMA Region VII plan reviews.

3.1 Local Government Participation

The Tribe made a commitment to the development of this 2023 single jurisdictional THMP as the sole participating jurisdiction. The DMA planning regulations and guidance stress that each local government (participating jurisdiction) seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the TMPC;

- Detail where within the Planning Area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For the SSN, "participation" meant the following:

- Providing facilities for meetings;
- Providing printed materials for meeting attendees;
- Attending and participating in the THMPC meetings;
- Completing and returning the Data Collection Worksheets;
- Collecting and providing other requested data (as available);
- Coordinating information sharing between internal and external agencies;
- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the Plan;
- Reviewing and providing comments on drafts of the Plan;
- Providing hardcopy Draft documents of the THMP for public review;
- Informing the public, local officials, and other interested stakeholders about the planning process and providing opportunity for them to comment on the Plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the THMP by the SSN Tribal Council.

The Tribe, seeking FEMA approval of this THMP, met all of these participation requirements. Multiple representatives from the SSN attended the THMPC meetings described in Table 3-3 and also brought together an internal planning team to help collect data, identify mitigation actions and implementation strategies, and to review and provide data on Plan drafts. Appendix A provides additional information and documentation of the planning process.

Specific individuals representing Tribal departments participating in this THMP were actively involved throughout the THMP development process as identified in Appendix A in the sign-in sheets for the meetings and as evident through the data, information and input provided by HMPC representatives to the development of this THMP. This Chapter 3 and Appendix A provides additional information and documentation of the planning process and participants to this THMP, including members of the THMPC.

3.2 The 10-Step Planning Process

Morrison Planning established the planning process for the SSN 2023 THMP using the DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-phase process:

1. Organize Resources;
2. Assess Risks;
3. Develop the Mitigation Plan; and
4. Implement the Plan and Monitor Progress.

Into this process, Morrison Planning integrated a more detailed 10-step planning process used for FEMA's CRS and FMA programs. Thus, the modified 10-step process used for this Plan meets the requirements of six major programs: FEMA's Hazard Mitigation Grant Program (HMGP); Pre-Disaster Mitigation (PDM) program and Building Resilient Infrastructure and Communities (BRIC); CRS program; FMA Program;

Severe Repetitive Loss (SRL) program; and new flood control projects authorized by the U.S. Army Corps of Engineers (USACE).

Table 3-1 shows how the modified 10-step process fits into FEMA's four-phase process. The sections that follow describe each planning step in more detail.

Table 3-1 Mitigation Planning Processes Used to Develop the SSN Tribal Hazard Mitigation Plan

DMA Process	Modified CRS Process
1) Organize Resources	
201.7(c)(1)	1) Organize the Planning Effort
201.7(b)(1)	2) Involve the Public
201.7(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.7(c)(2)(i)	4) Identify the Hazards
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201.7(c)(3)(i)	6) Set Goals
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4) Implement the Plan and Monitor Progress	
201.7(c)(5)	9) Adopt the Plan
201.7(c)(4)	10) Implement, Evaluate, and Revise the Plan

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With SSN's commitment to participate in the DMA planning process, Morrison Planning worked with the the SSN Vice-Chairman (as overall project lead) to establish the framework and organization for development of this THMP. An initial call and internal project kickoff meeting was held with key Tribal representatives in April of 2023 to discuss the organizational and process aspects of this THMP development process.

The initial kick-off meeting was held on June 7, 2023. Invitations to the kickoff meeting was extended to key Tribal departments as well as to other federal, state, and local stakeholders that might have an interest in participating in the planning process. Representatives from the SSN and key community stakeholders participated in this THMP project with additional invitations extended as appropriate throughout the planning process. The list of invitees is included in Appendix A.

The THMPC, comprising key SSN staff and other government and stakeholder representatives developed this THMP with leadership from the Vice-Chairman, and facilitation by Morrison Planning. Table 3-2 shows who participated on the THMPC.

Table 3-2 Hazard Mitigation Planning Committee

Name	Department/Agency
Santee Sioux Nation	
Robert Henry	Police Dept.
Seymour Brandt	Fire Department/Utilities
Dewayne Traverse	BIA Firefighters
Mike Crosley	Land Management/Transit
LeeAnn Payer	Utilities
Diane Lapointe	Higher Education
Alisha Bartling	EPA Department
Dan Redowl	Chief Executive Officer
Page Hingst	–
Justin Avery	Water Manager - SSN O3P
Alonzo Denney	Chairman
Stuart Redwing	SSN Tribal Council
Larry Thomas	THPO/Casinos
Carrie Rouillard	SSN District Representative - Council
Danielle Rossler	NCDHD Emergency Response Coordinator
Cindy Nagel	Elementary Principal
Chelsey Chohon	Santee Community Schools
Kameron Runnels	Vice Chair
Joyce Thomas	Head Start
Byron Tuttle	SSN Tribal Council
Andrea McBride	Society of Care (SOC)
Jamisina Webster	SOC (Director: substance abuse Prevention)
Eliza Thomas	SSN
Maunka Morgan	SSN Enterprises
Wakiyan Thomas	Tribal Courts
Diana Thomas	–
Michael Clossman	Cap Office
Other Agencies/Groups	
Victoria Champaign	Ponca Tribe
Doyle Hazen	North Central Power Company
Todd Zimmerer	North Central Power Company

Name	Department/Agency
Brenda Wabasha	Member of the Public
Adrianna Duarte	Member of the Public

This list includes all TMPC members that attended one or more TMPC meetings detailed in Table 3-3, as well as those who provided key input into the Plan development process. In addition to providing representation on the THMPC, the SSN further formulated an internal planning team to collect and provide requested data and to conduct timely reviews of the draft documents. The internal planning team includes both those participating on the THMPC and other SSN staff.

Meetings

The planning process officially began with an internal project planning call in April 2023 followed by an THMPC kick-off meeting held in Santee on June 7, 2023. The meetings covered the scope of work and an introduction to the DMA requirements. During the THMPC meetings, participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the THMP. Using FEMA guidance, these worksheets were designed to capture information on past hazard events, identify hazards of concern to the City, quantify values at risk to identified hazards, inventory existing capabilities, and to identify possible mitigation actions. A copy of the worksheets for this project are included in Appendix A. The SSN seeking FEMA approval of this THMP completed and returned the worksheets to Morrison Planning for incorporation into this THMP.

During the planning process, the THMPC communicated through face-to-face meetings, email, telephone conversations, Dropbox websites, and through an SSN developed webpage dedicated to the Plan development process. This later website was developed to provide information to the THMPC, the public and all other stakeholders on the THMP process. Draft documents were also posted on this website so that the THMPC members and the public could easily access and review them. The THMP website (shown on Figure 3-1) can be accessed at: https://santeesiouxnation.com/hazard-mitigation-plan.

Figure 3-1 SSN Tribal Hazard Mitigation Plan Website

Source: SSN

The THMPC met formally five times during the planning period (April 2023 – November 2023) which adequately covers the four phases of DMA and the 10-Step CRS planning process. The formal meetings held and topics discussed are described in Table 3-3. Invitations, agendas and sign-in sheets for each of the meetings are included in Appendix A.

Table 3-3 THMPC Meetings

Meeting Type	Meeting Topic	Meeting Date(s)	Meeting Location(s)
THMPC #1 Kick-off Meeting	1) Introduction to DMA and the planning process 2) Organize Resources: the role of the THMPC, planning for public involvement, coordinating with other agencies/stakeholders 3) Introduction to Hazard Identification	June 7, 2023	SSN Tribal Headquarters
THMPC #2	1) Risk assessment overview and work session - Assess the Hazard - Assess the Problem	July 19, 2023	SSN Tribal Headquarters

Meeting Type	Meeting Topic	Meeting Date(s)	Meeting Location(s)
THMPC #3	1) Introductions 2) Status of the DMA Planning Process 3) Risk Assessment Summary Overview 4) Priority Hazards Review 5) Develop Plan Goals 6) Review Mitigation Categories and Selection Criteria 7) Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard 8) Prioritization of Mitigation Actions/Projects 9) Questions	September 20, 2023	SSN Tribal Headquarters
THMPC #4	1) Review of final HMPC, jurisdictional and public comments and input to plan 2) Draft an Action Plan 3) Plan maintenance and Implementation Procedures	November 15, 2023	SSN Tribal Headquarters

Planning Step 2: Involve the Public

Up-front coordination discussions with the SSN established the initial plan for public involvement. Public involvement activities for this THMP included press releases, social media communications, stakeholder and public meetings, development of an THMP webpage and associated website postings, and the solicitation of public and stakeholder comments on the draft THMP through a variety of mechanisms. Information provided to the public included an overview of the THMP process, including a review of the hazard risk assessment and proposed mitigation strategies for this THMP. At the planning team kick-off meeting, the THMPC discussed additional strategies for public involvement and agreed to an approach using established public information mechanisms and resources within the SSN.

Early Public Outreach Activities

Public outreach for this THMP began at the beginning of the plan development process with the development of a SSN webpage and outreach document on the THMP development process through a variety of mechanisms as described below:

- Outreach on the Tribal website
- Early public meeting press release
- Outreach on Tribal social media sites:
- Outreach through flyers posted throughout the Santee Sioux Nation

The purpose of this outreach was to inform the public and other stakeholders of SSN's THMP project and how they could get involved and how to provide comments on the draft THMP prior to submittal to /FEMA. The initial outreach also invited the public and stakeholders to the public kickoff meeting for the project. Information on these outreach efforts can be seen in Appendix A to this THMP.

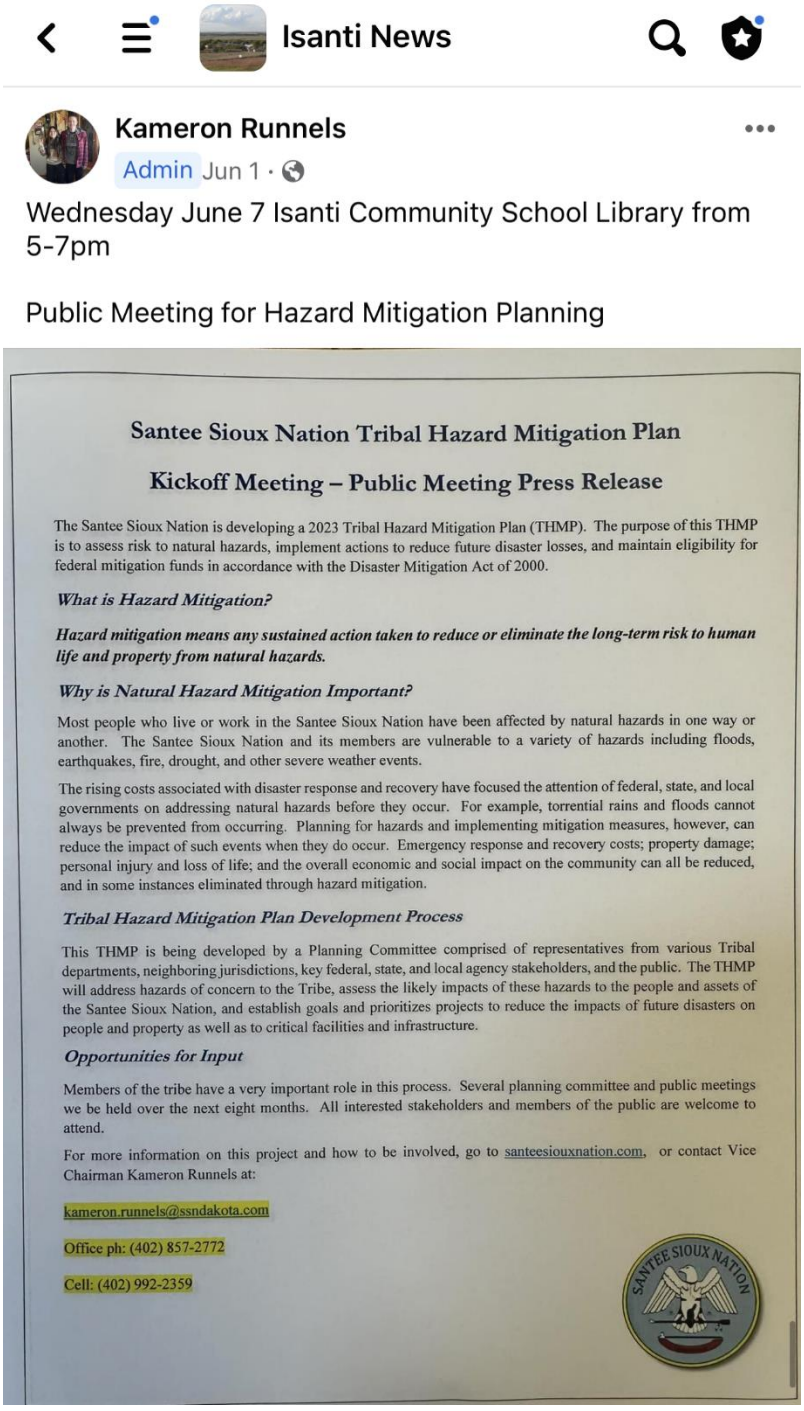
Public Meetings

Two public meetings were planned for this THMP project, during key times of the THMP development process:

Public Meeting #1: THMP Kickoff

Public outreach for this THMP began at the beginning of the Plan development process with an advertisement placed on the SSN website, through public information flyers posted in various locations in the SSN, through the Isanti News (see Figure 3-2) and other local outreach methods to inform the public of the purpose of the DMA and the hazard mitigation planning process for the SSN. A press release was also issued at the beginning of the project to invite the public to the public meeting for the kick-off of the THMP project on June 7, 2023.

Figure 3-2 Public Outreach on Isanti News



Source: Santee Sioux Nation

Public Meeting #2: Meeting on the Draft THMP

A public meeting was held on November 15, 2023 to present the draft THMP and to collect public comments on the Plan prior to finalization and submittal to FEMA. The public meeting on the draft THMP

was advertised in a variety of ways to maximize outreach efforts to the public. This can be seen on Figure 3-3. More public outreach efforts are shown in Appendix A.

Figure 3-3 SSN Public Outreach at Isanti Community School

Documentation to support the public meetings can be found in Appendix A. In addition to advertisement for public participation, notices of meetings were sent directly to all persons on the HMPC contact list and also to other agency and key stakeholders with an interest in the SSN THMP project. The majority of these people reside on SSN Lands. Additional outreach for review of the Draft THMP included:

- The public was invited to meetings on the SSN website and Facebook page.
- Public flyers were placed at the SSN Grocery Store and the Lakeview C-Store.
- Public flyers were posted at the SSN Headquarters.

The formal public meetings for this project are summarized in Table 3-4.

Table 3-4 Public Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Public Meeting #1	1) Intro to DMA and mitigation planning 2) THMPC Development Process	June 7, 2023	Santee Public School
Public Meeting #2	1)Presentation of Draft THMP and solicitation of public and stakeholder comments	November 15, 2023	SSN Tribal Headquarters

Where appropriate, stakeholder and public comments and recommendations were incorporated into the THMP throughout the Plan development process, including the sections that address mitigation goals and strategies. No public comments were received on the Draft Plan. All newspaper advertisements, website postings, and public outreach efforts are on file with the Tribe and are also included in Appendix A.

The draft THMP is currently available online on the SSN website at: https://santeesiouxnation.com/hazard-mitigation-plan.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the THMPC determined that data collection, mitigation strategy development, and plan approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the process. Based on their involvement in hazard mitigation planning, their involvement in the SSN, and/or their interest as a neighboring jurisdiction, representatives from the following agencies were invited to participate on the THMPC:

- FEMA Region VII
- Fire Departments
- Nebraska Emergency Management Agency
- North Central Power District
- US Fish and Wildlife
- National Weather Service
- Knox County
- United States Army Corps of Engineers
- United States Bureau of Indian Affairs

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the THMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Coordination involved contacting these agencies and informing them on how to participate in the THMP development process and if they had any expertise or assistance they could lend to the planning process, risk assessment, or mitigation strategy. These groups and agencies were solicited asking for their assistance and input, telling them how to become involved in the THMP, and inviting them to THMPC meetings.

In addition, as part of the overall stakeholder and agency coordination effort, the THMPC coordinated with and utilized input to the THMP from the following agencies:

- FEMA Region VII
- Library of Congress
- Knox County Emergency Management
- National Oceanic and Atmospheric Association
- National Performance of Dams Program
- National Register of Historic Places
- National Resource Conservation Service
- National Response Center
- National Weather Service
- Nebraska Emergency Management Agency
- North Central Public Power Company
- United States Army Corps of Engineers
- United States Bureau of Indian Affairs
- United States Bureau of Land Management
- United States Bureau of Reclamation
- United States Geological Survey

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to some of these groups to actively participate on the THMPC. Others assisted in the process by providing data directly as requested or through data contained on their websites or as maintained by their offices. Further as part of the public outreach process, all groups were invited to attend the public meeting and to review and comment on the THMP prior to submittal to FEMA.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with planning efforts is also paramount to the success of this THMP. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. The SSN uses a variety of planning mechanisms to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this THMP establishes a credible and comprehensive plan that ties into and supports other SSN programs. The development of this THMP incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- 2020 North Central Power District Hazard Mitigation Plan

- 2020 Lower Elkhorn Natural Resource District Local Hazard Mitigation Plan
- 2021 State of Nebraska Hazard Mitigation Plan
- 2022 State of Nebraska Flood Hazard Mitigation Plan
- 2023 Draft Tri-County Local Hazard Mitigation Plan
- BIA plans
- Community Wildfire Protection Plans
- Environmental Impact Reports
- FEMA mitigation planning documents
- Flood Insurance Studies
- US Army Corps of Engineers Reports
- US Fish and Wildlife reports
- USGS Reports

Specific source documents are referenced at the beginning of each section of Chapter 4 and in Appendix B. These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. In accordance with DMA requirements and guidance, Best Available Data was used throughout in the development of this THMP. Where the data from the existing studies and reports is used in this THMP, the source document is referenced throughout this THMP. Appendix B References provides a detailed list of references used in the preparation of this THMP.

3.2.2. Phase 2: Assess Risks

Planning Steps 4 and 5: Identify the Hazards and Assess the Risks

Morrison Planning led the HMPC in a research effort to identify, document, and profile all the hazards that have, or could have, an impact the SSN Planning Area. The HMPC relied on information from the 2023 Tri-County Local Hazard Mitigation Plan (which includes Knox County – where the SSN resides), the 2021 State of Nebraska Hazard Mitigation Plan, the 2020 Lower Elkhorn Natural Resources District Local Hazard Mitigation Plan (which included the neighboring Ponca Tribe) and many other sources to establish the hazards list and associated data for this THMP. Data collection worksheets were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the Planning Area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

The THMPC also conducted a capability assessment to review and document the Tribe's current capabilities to mitigate risk from and vulnerability to hazards. By collecting information about existing Tribal programs, policies, regulations, ordinances, and emergency plans, the THMPC could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process, methodologies, and results are included in Chapter 4 Risk Assessment.

NFIP Participation

Also to be noted, DMA requires an assessment of a jurisdiction's continued compliance with the NFIP as part of an THMP. The Tribe is not a participant in the NFIP.

High Hazard Potential Dam (HHPD) Program

Dams are an aging infrastructure; the average age of dams in the US is 57 years. High hazard potential is a classification standard for any dam whose failure or mis-operation will cause loss of human life and significant property destruction. Many of these high hazard dams lack regular maintenance and improvements and present an ongoing risk to nearby communities. In response to this issue, the Consolidated Appropriations Act, 2019 passed in February appropriated millions for each of fiscal years 2021 through 2026. The purpose of the HHPD program is to provide assistance for repair, removal or rehabilitation of HHPDs, and may include funding for technical, planning, design, and construction activities. The focus on this new program is to provide funding for those dams that pose an unacceptable risk to the public. In order to be eligible for this grant program, all dam risks must be addressed in both state and local hazard mitigation plans, in addition to other eligibility requirements.

The SSN, the single jurisdiction seeking FEMA approval of the 2023 THMP is not a current dam owner and thus is not eligible to participate in this program.

3.2.3. Phase 3: Develop the Mitigation Plan

Planning Steps 6 and 7: Set Goals and Review Possible Activities

Morrison Planning facilitated brainstorming and discussion sessions with the THMPC that described the purpose and process of developing planning goals and objectives and a comprehensive range of mitigation alternatives, as well as a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 5 Mitigation Strategy. Additional documentation on the process the THMPC used to develop the goals and mitigation strategy is in Appendix C.

Planning Step 8: Draft an Action Plan

Based on input from the THMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, a complete first draft of the THMP was developed. This complete draft was provided for THMPC review and comment via a Dropbox web link. THMPC comments were integrated into the second, public review draft, which was advertised and distributed to collect public input and comments. The HMPC integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a third draft for review and approval by FEMA Region VII, contingent upon final adoption by the SSN Tribal Council.

3.2.4. Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the THMP, this THMP was adopted by the SSN Tribal Council using the sample resolution contained in Appendix D.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the THMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 7 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the SSN Planning Area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the implementation and ongoing success of this THMP and hazard mitigation in the Tribe and is addressed further in Chapter 7.

Chapter 4 Risk Assessment

Requirement §201.7(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the probability of a hazard event resulting in an adverse condition that causes injury or damage."

The Santee Sioux Nation (SSN or Tribe) risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a jurisdiction's potential risk to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment into a four-step process:

1. Identify hazards.
2. Profile hazard events.
3. Inventory assets.
4. Estimate losses.

Data collected through this process has been incorporated into the following sections of this chapter:

- **Section 4.1 Hazard Identification: Natural Hazards** identifies the natural hazards that threaten the SSN and describes why some hazards have been omitted from further consideration.
- **Section 4.2**. **Santee Sioux Nation Assets at Risk** identifies the structures and property values; populations; critical facilities; cultural, historical, and natural resources; and future development at risk. This information is not hazard specific and covers the entire Tribal Planning Area.
- **Section 4.3: Hazard Profiles and Vulnerability Assessment** provides an overview of each hazard, its location and extent, and discusses the risk, vulnerability, and impacts of each natural hazard to the Tribe. The hazard profile also describes previous occurrences of hazard events and the probability of future occurrences. The vulnerability assessment evaluates the Tribe's exposure to natural hazards; considering assets at risk, populations at risk, critical facilities, future development trends, and, where possible, estimates potential hazard losses.
- **Section 4.4 Capability Assessment** inventories existing mitigation activities and policies, regulations, plans, and programs that pertain to mitigation in the Tribe and can affect net vulnerability.

This risk assessment covers the entire geographical extent of the Santee Sioux Nation. Hereinafter in this document, this will be referred to as the Tribal Planning Area.

4.1 Hazard Identification: Natural Hazards

Requirement §201.7(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

A hazard identification evaluation was conducted to determine the natural hazards that threaten the Tribe. This section details the methodology and results of this effort.

Data Sources

The following data sources were used for this Hazard Identification portion of the Plan:

- 2020 Lower Elkhorn Natural Resource District Local Hazard Mitigation Plan
- 2020 North Central Public Power District Annex to the Nebraska Hazard Mitigation Plan
- 2021 Nebraska State Hazard Mitigation Plan
- 2023 Tri-County (including Knox County) Hazard Mitigation Plan
- FEMA Disaster Declaration Database
- THMPC input
- National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) Storm Events Database

4.1.1. Methodology and Results

Using existing natural hazards data and input gained through the kickoff planning meeting, the THMPC agreed upon a list of natural hazards that could affect the Tribe. Hazards data from the Nebraska Emergency Management Agency (NEMA), FEMA, the National Oceanic and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the Tribe. The natural hazards evaluated as part of this Plan include those that have occurred historically and/or have the potential to cause significant human and/or monetary losses in the future. Those hazards identified as a high or medium significance are initially considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact on the Tribe were determined to be of low significance and not considered a priority hazard. After a review of the risk assessment, Section 4.3.13 shows the finalized ranking of priority hazards for mitigation planning purposes. Significance of each identified hazard was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. The ability of a community to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard.

The following hazards in Table 4-1, listed alphabetically, were identified and investigated for this THMP. As a starting point, the 2020 Lower Elkhorn Natural Resource District Local Hazard Mitigation Plan, the 2023 Knox County Local Hazard Mitigation Plan, and the 2021 State of Nebraska Hazard Mitigation Plan (2021 State Hazard Mitigation Plan) were consulted to evaluate the applicability of hazards of concern to the Santee Sioux Nation.

Table 4-1 Santee Sioux Nation Hazard Identification and Comparison

2020 Lower Elkhorn NRD LHMP	2023 Knox County Plan	2021 State of Nebraska Plan	Proposed Santee Sioux Nation 2023 Hazards
Animal Disease	Animal Disease	Animal Disease	–
Dam Failure	Dam Failure	Dam Failure	Dam Failure
Drought	Drought	Drought	Drought and Water Shortage
Earthquakes	Earthquakes	–	–
Extreme Heat	Extreme Cold	Extreme Temperature	Severe Weather: Extreme Heat
Flooding	Flood/Flash Flood	Flood/Flash Flood	Flood: 1% and 0.2% Annual Chance
–	Public Health Epidemic	Human Infectious Disease	–
–	Landslides	–	Landslide
Levee Failure	–	Levee Failure	–
–	Agricultural Plant Disease	Plant Disease and Pests	–
Chemical Fixed Sites and Transportation	Hazardous Materials	–	–
Hail	–	–	Severe Weather: Heavy Rain and Storms
High Winds	High Winds	–	Severe Weather: High Winds and Tornadoes
Severe Thunderstorms	Severe Thunderstorms	Severe Thunderstorm	Severe Weather: Heavy Rain and Storms
Severe Winter Storms	Severe Winter Storms	Severe Winter Storm	Severe Weather: Winter Storms
Terrorism	–	Terrorism	–
Tornado	Tornado	Tornado	Severe Weather: High Winds and Tornadoes
Wildfire (Grass)	Wildfire	Wildfire	Wildfire
–	–	Power Failure	–

Certain natural (non-man-made) hazards were excluded from consideration for this Plan. They are shown in Table 4-2.

Table 4-2 Santee Sioux Nation – Excluded Natural Hazards

Hazard Excluded	Why Excluded
Avalanche	No avalanche areas exist on tribal lands.
Earthquake	The area the Tribe is located in is relatively aseismic.

Hazard Excluded	Why Excluded
Erosion	This does not affect the Tribe in a significant way.
Expansive Soils	This does not affect the Tribe in a significant way.
Hurricane	The Tribe is located far from the coast.
Sea Level Rise	The Tribe is located far from the coast.
Storm Surge	The Tribe is located far from the coast.
Subsidence	Subsidence is either occurring very slowly or not at all.
Tsunami	The Tribe is located far from the coast.

The worksheet below was completed by the Tribe to identify, profile, and rate the significance of identified hazards.

Table 4-3 Santee Sioux Nation Initial Hazard Identification

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Dam Failure	Extensive	Unlikely	Critical	Low	Medium
Drought and Water Shortage	Extensive	Likely	Negligible	Medium	High
Flood: 1%/0.2% annual chance	Significant	Unlikely	Limited	Medium	High
Hazardous Materials: Transportation	Significant	Occasional	Limited	Low	Low
Landslide	Limited	Likely	Limited	Medium	Medium
Pandemic	Extensive	Occasional	Critical	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rain and Storms	Extensive	Highly Likely	Limited	High	High
Severe Weather: High Wind and Tornado	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Winter Storms	Extensive	Highly Likely	Critical	High	Low
Wildfire	Extensive	Highly Likely	Catastrophic	High	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Probability of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Climate Change Influence
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Source: Santee Sioux Nation

4.1.2. Disaster Declaration History

One method to identify hazards based upon past occurrences is to look at what events triggered federal and/or state disaster declarations within the Tribe or the County in which the Tribe is located (as disaster declarations are generally declared on a county basis). Disaster declarations are granted when the severity and magnitude of the event's impact surpass the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, following the local agency's declaration, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state government's capacity is exceeded, a federal disaster declaration may be issued allowing for the provision of federal disaster assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors. This section focuses on state and federal disaster and emergency declarations.

Knox County has experienced 19 federal declarations since 1950. 14 of the federal declarations were associated with flood events (including heavy rain and storms), 3 from pandemic, 1 for hurricane (for evacuations stemming from Hurricane Katrina in 2005), and 1 snowstorm. It should be noted that in 2013, federal disaster declarations were available for tribal governments. The Tribe has declared 3 times since then, with 2 declarations for the Covid-19 pandemic and 1 for flooding. Details of each federal disaster declaration are detailed in Table 4-4. A summary of federal disaster declarations for Knox County where the Santee Sioux Nation is located is shown in Table 4-5.

Table 4-4 Knox County Disaster Declarations 1950-2023

Year	Disaster Name	Disaster Type	Disaster #	Federal Declaration Date
2022	Nebraska Severe Storms and Straight-Line Winds	Severe Storm	DR-4662	7/27/2022
2020*	Nebraska Covid-19 Pandemic	Biological (Pandemic)	DR-4521	4/4/2020
2020*	Nebraska Covid-19	Biological (Pandemic)	EM-3483	3/13/2020
2020	Santee Sioux Nation Covid-19	Biological (Pandemic)	EM-3523	3/13/2020
2019*	Nebraska Severe Winter Storm, Straight-line Winds, and Flooding	Flood	DR-4420	3/21/2019
2018	Nebraska Severe Winter Storm and Straight-line Winds	Snowstorm	DR-4375	6/29/2018
2011	Nebraska Flooding	Flood	DR-4013	8/12/2011
2011	Nebraska Flooding	Flood	DR-3323	6/18/2011

Year	Disaster Name	Disaster Type	Disaster #	Federal Declaration Date
2010	Nebraska Severe Storms, Flooding, and Tornadoes	Severe Storm	DR-1924	6/15/2010
2010	Nebraska Severe Winter Storms and Snowstorm	Severe Storm	DR-1878	2/25/2010
2007	Nebraska Severe Storms, Flooding, and Tornadoes	Severe Storm	DR-1706	6/6/2007
2006	Nebraska Severe Winter Storms	Severe Storm	DR-1674	1/7/2007
2005	Nebraska Severe Winter Storm	Severe Storm	DR-1627	1/26/2006
2005	Nebraska Hurricane Katrina Evacuation	Hurricane	EM-3245	9/13/2005
2003	Nebraska Severe Storms and Tornadoes	Severe Storm	DR-1480	7/21/2003
1978	Nebraska Storms, Ice Jams, Snowmelt, Flooding	Flood	DR-552	3/24/1978
1971	Nebraska Floods	Flood	DR-308	7/7/1971
1971	Nebraska Floods	Flood	DR-303	2/23/1971
1967	Nebraska Severe Storms, Flood	Flood	DR-228	7/18/1967

Source: Cal OES, FEMA
*indicates both Knox County and the Santee Sioux Nation were given disaster declarations for this event.

Table 4-5 Knox County Disaster Declarations 1950-2023 Summarized by Disaster Type

Disaster Type	Federal Declarations	
	Count	Years
Flood (with heavy rain and storms)	14	1967,1971 (twice), 1978, 2003, 2005, 2006, 2007, 2010 (twice), 2011 (twice), 2019, 2022
Hurricane	1	2005
Pandemic	3	2020 (three)
Snowstorm	1	2018
Totals	**19**	**–**

Source: FEMA

4.2 Assets Inventory

As a starting point for analyzing the SSN's vulnerability to identified hazards, a variety of data was used to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to

occur in the SSN, this section describes significant structures, populations, and other resources at risk. Data and analysis used in this baseline assessment include:

- Values at Risk;
- Critical Facilities
- Natural, Historical, and Cultural Resources; and
- Growth and Development Trends.

Data Sources

- 2017-2021 American Community Survey
- Agency for Toxic Substances and Disease Registry Geospatial Research, Analysis & Services Program
- ESRI databases
- Hazus 6.0
- National Register of Historic Places
- Nebraska Game and Parks Division
- State of Nebraska Parcel Data 2022
- THMPC input
- US Fish and Wildlife Service Environmental Conservation Online System

4.2.1. Values at Risk

Parcel Inventory and Values

This analysis captures the values associated with assessed assets located within the Santee Sioux Nation. The SSN GIS Parcel data (which originated from the State of Nebraska and was dated 2022), was used for the basis of this analysis. This data represents best available data.

Understanding the total value of the SSN is a starting point to understanding the overall value of identified assets in the Tribe. When the values are combined with potential values associated with other community assets such as area populations, public and private critical infrastructure, historic and cultural resources, and natural resources, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of natural hazards within the Tribe.

Methodology

The SSN GIS Parcel data was used as the basis for the inventory of assessed values for both improved and unimproved parcels within the SSN. This data provides the estimated land and improved (structure) values assessed for each parcel. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from state sources to support mapping and analysis of values at risk.

The Parcel/Assessor data was obtained from the State of Nebraska. Within this GIS layer, there were 1,590 total parcels, with no duplicate parcels. Of these, 255 are improved parcels (meaning a structure is on the property).

Data Limitations & Notations

Although based on best available data, the resulting information should only be used as an initial guide to overall values in the Tribe. In the event of a disaster, structures and other infrastructure improvements are at the greatest risk of damage. Depending on the type of hazard and resulting damage, the land itself may not suffer a significant loss. For that reason, the values of structures and other infrastructure improvements are of greatest concern. As a result, overall property value information is likely significantly low and does not reflect current market or true potential loss values for properties within the Tribe.

Land Use Categories and Estimated Content Replacement Values

The best available data for Tribal parcels came from the State of Nebraska. This data did not include a land use code or type. Since no land use categories were available, the Tribe reviewed the properties on Tribal lands to develop estimated content replacement values (CRVs) that are potentially at loss from hazards. FEMA's standard CRV factors were utilized to develop more accurate loss estimates for total assets inventory and for all mapped hazard analyses. FEMA's CRV factors estimate value as a percent of improved structure value by land use. Since much of the improved properties on Tribal lands are residential, the estimated CRV factor from Hazus was used to estimate contents values. This is shown on Table 4-6.

Table 4-6 SSN – Content Replacement Factors by Land Use

Land Use Categories	Hazus Land Use Categories	Hazus Content Replacement Values
Residential	Residential	50%

Source: Hazus 6.0

SSN Values at Risk Results

Table 4-7 shows the total values of the Tribe, including estimated CRVs (using CRV multipliers from Table 4-6). This table is important as potential losses to the Tribe include structure contents. In addition, loss estimates contained in the hazard vulnerability sections of this Chapter will use calculations based on the total values, including content replacement values.

Table 4-7 Santee Sioux Nation – Total Values at Risk Summary

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Santee Sioux Nation	1,590	255	$203,082,786.70	$11,948,868.80	$5,974,434.40	$221,006,089.90
Grand Total	**1,590**	**255**	**$203,082,786.70**	**$11,948,868.80**	**$5,974,434.40**	**$221,006,089.90**

Source: State of Nebraska Parcel Data 2022

4.2.2. Critical Facilities and Infrastructure

The operation of critical facilities and infrastructure during and after a disaster is crucial. Their ability to keep functioning affects both the severity of the impacts and the speed of recovery.

Critical facilities and infrastructure commonly include all public and private facilities and infrastructure that a community considers essential for the delivery of vital services and for the protection of the community. They usually include emergency response facilities (fire stations, police stations, rescue squads, and emergency operation centers [EOCs]), custodial facilities (jails and other detention centers, long-term care facilities, hospitals, and other health care facilities), schools, emergency shelters, utilities (water supply, wastewater treatment facilities, and power), communications facilities, and any other assets determined by the community to be of critical importance for the protection of the health and safety of the population.

The SSN has developed a definition of critical facilities for the City based on the definition of critical facilities under the National Flood Insurance Program's (NFIP) Community Rating System (CRS), which utilizes definitions under the American Society of Civil Engineers (ASCE) 7 Standard, Minimum Design Loads for Buildings and Other Structures and the International Codes' definition for Category III and IV buildings.

> ***Critical Facility: A structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities include health and safety facilities, utilities, government facilities and hazardous materials facilities.***

Using this definition, those critical facilities that fall within the SSN can be seen in Figure 4-1 and summarized by facility type in Table 4-8. ***Note***: one facility owned by the Tribe, the Educational Residential Facility, falls outside the SSN boundaries. As such, on the hazard maps in Section 4.3 below that facility is not analyzed.

Figure 4-1 SSN – Critical Facilities

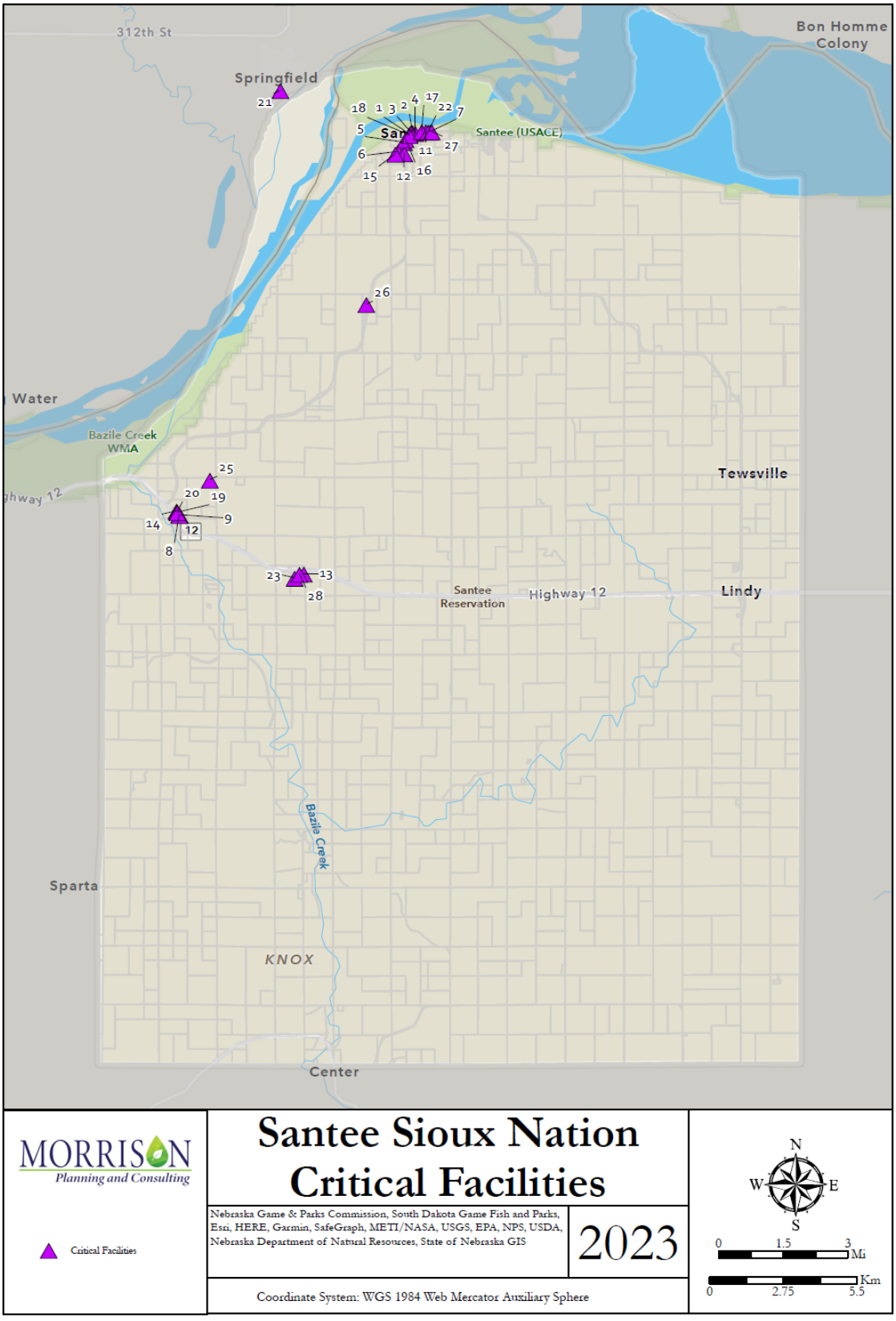


Table 4-8 SSN – Critical Facilities Owned by the Tribe

Location ID	Facility Name	Value
1	Main Tribal Office	$2,867,600
2	Tribal Court	$246,742
3	Transfer Station	$37,343
4	Utility Office	$255,409
5	Day Care Center	$24,503
6	Cultural Museum	$539,280
7	Police Station	$348,075
8	Land Management Office	$1,713,987
9	Warriors Lodge/Youth Center	$251,980
10	Metal Quonset	$40,947
11	Teen Center	$219,739
12	Grocery Store	$1,429,044
13	Feather Hill Express Station (Vacant)	$174,475
14	Dakota Transit	$187,785
15	Medical Clinic	$18,532,400
16	Lakeview Gas & C-Store	$850,200
17	Fire House	$566,030
18	Domestic Violence Home	$316,292
19	Industrial Park Building (Dollar Plus)	$2,093,558
20	Feather Hill Express Station	$3,252,050
21	Educational Residential Facility	$387,340
22	Community Swimming Pool	$585,054
23	Tatanka Golf Course	$6,352,095
24	Not Used	–
25	S.T. Ranch	$656,123
26	Kaylon's House and Shop	$314,366
27	Santee Mini Storage	$107,214
28	Ohiya Casino	$20,801,032

Source: SSN

4.2.3. Natural, Historical, and Cultural Resources

Assessing the vulnerability of the Santee Sioux Nation to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.

- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The Tribe's lands contain a variety of natural resources. The sections below discuss key natural resources that fall within the Tribe that are potentially at risk to a hazard event.

Wetlands and their Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the State of Nebraska Department of Natural Resources Water Administration Division. Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas, where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

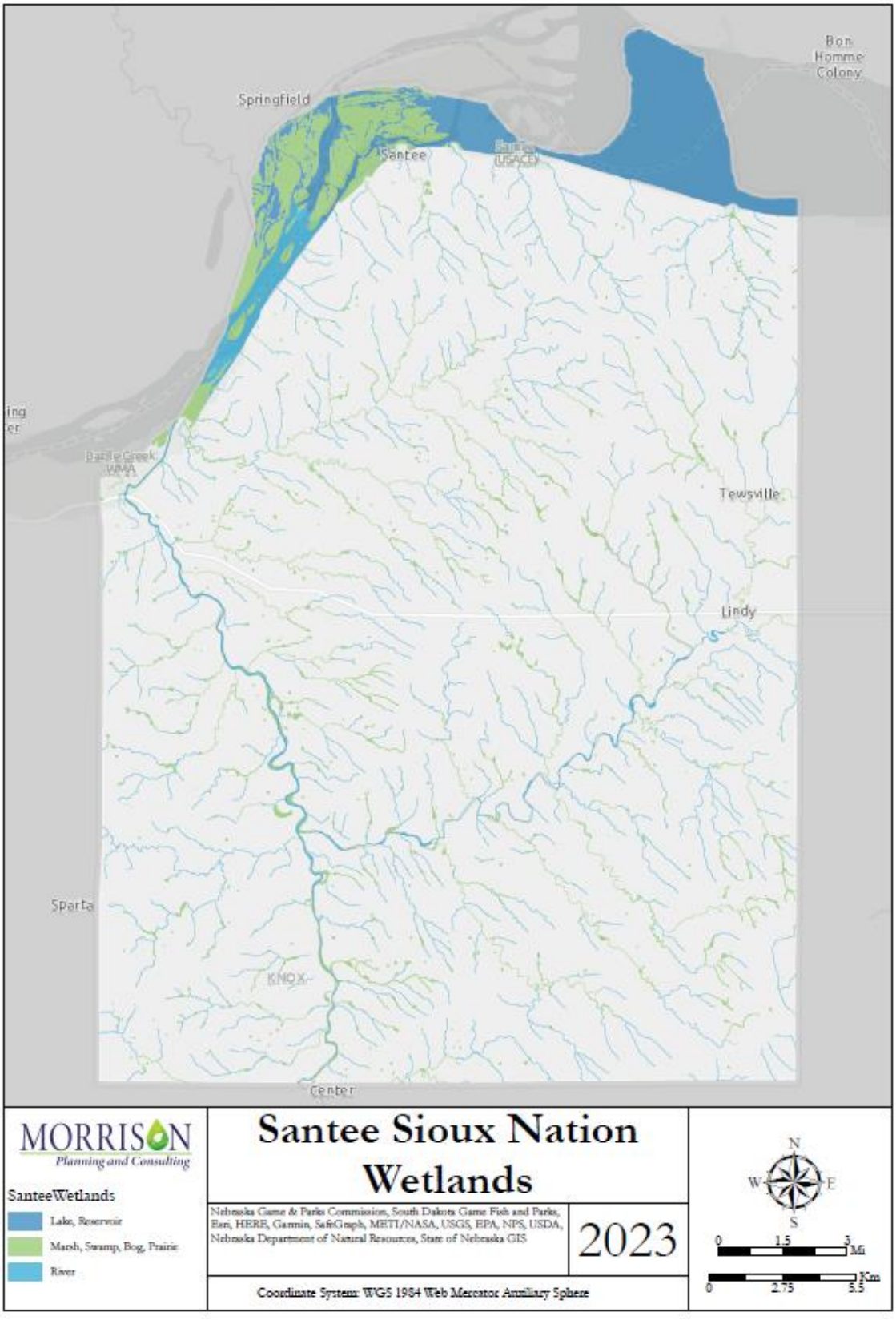
Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the Tribe.

Wetlands in the SSN are shown in Figure 4-2.

Figure 4-2 Santee Sioux Nation – Wetland Areas



Critical Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the Tribe. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed. There are many federal endangered, threatened, or candidate species in or near the Tribe. The US Fish and Wildlife Database was searched for listed species. The Tribe contained 14 possible species. These species are shown in Table 4-9.

Table 4-9 Santee Sioux Nation– Threatened and Endangered Species

Scientific Name	Common Name	Listing Status	Group
Grus americana	Whooping crane	Endangered	Birds
Numenius borealis	Eskimo curlew	Endangered	Birds
Charadrius melodus	Piping Plover	Threatened	Birds
Scaphirhynchus albus	Pallid sturgeon	Endangered	Fishes
Notropis topeka (=tristis)	Topeka shiner	Endangered	Fishes
Lampsilis higginsii	Higgins eye (pearlymussel)	Endangered	Clams
Leptodea leptodon	Scaleshell mussel	Endangered	Clams
Nicrophorus americanus	American burying beetle	Threatened	Insects
Penstemon haydenii	Blowout penstemon	Endangered	Flowering Plants
Spiranthes diluvialis	Ute ladies'-tresses	Threatened	Flowering Plants
Platanthera praeclara	Western prairie fringed Orchid	Threatened	Flowering Plants
Cicindela nevadica lincolniana	Salt Creek Tiger beetle	Endangered	Insects
Calidris canutus rufa	Red knot	Threatened	Birds
Myotis septentrionalis	Northern Long-Eared Bat	Endangered	Mammals

Source: US Fish and Wildlife Service Environmental Conservation Online System. Retrieved 6/12/2023.

Historical and Cultural Resources

The Tribe has many historical areas and properties. To inventory these resources, information was collected from the National Register of Historic Places Listings in Nebraska. The National Register of Historic Places is a list of historic places that tell the stories of the people and events that form America's collective identity. This prestigious list is also one of the most valuable tools individuals and communities have to encourage the preservation of important historic places. Nebraska currently has over 1,000 listed properties throughout the State. These properties range from private residences to county courthouses to archeological sites. Also, properties listed in the National Register are potentially eligible for State and Federal tax incentives.

Based on these sources, there are two historic properties in the Tribe.

- Pilgrim Congregational Church and Manse
- Episcopal Church (Church of our Most Merciful Savior

The Tribal Historic Preservation Officer noted that there are more areas considered historic and culturally important to the Tribe. Due to privacy concerns, these additional areas were not provided for this THMPC.

4.2.4. Growth and Development Trends

As part of the THMP development process, changes in growth and development, both past and future, are evaluated and examined in the context of the Tribe and with respect to hazard-prone areas, and how the changes in growth and development affects the vulnerability of the SSN to future disasters.

Past and Current Populations

The estimated population of the SSN from the US Census Bureau was 904. This is from the 2017-2021 American Community Survey. The tribe has seen a drastic decrease in its numbers in recent years past but has begun to see a slow increase as individuals move back to the tribe or live away from the reservation but choose to be registered regardless.

Special Populations and Disadvantaged Communities

The Tribe is a very socially and economically diverse community, and many residents that are economically disadvantaged due to varying reasons reside within the SSN. The Tribe and surrounding Knox County are no strangers to large natural disasters which have had a direct impact on the populations of the area. Special populations and disadvantaged communities in the Tribe are discussed by the following sources:

- CDC Social Vulnerability Index
- THMPC Input

CDC Social Vulnerability Index

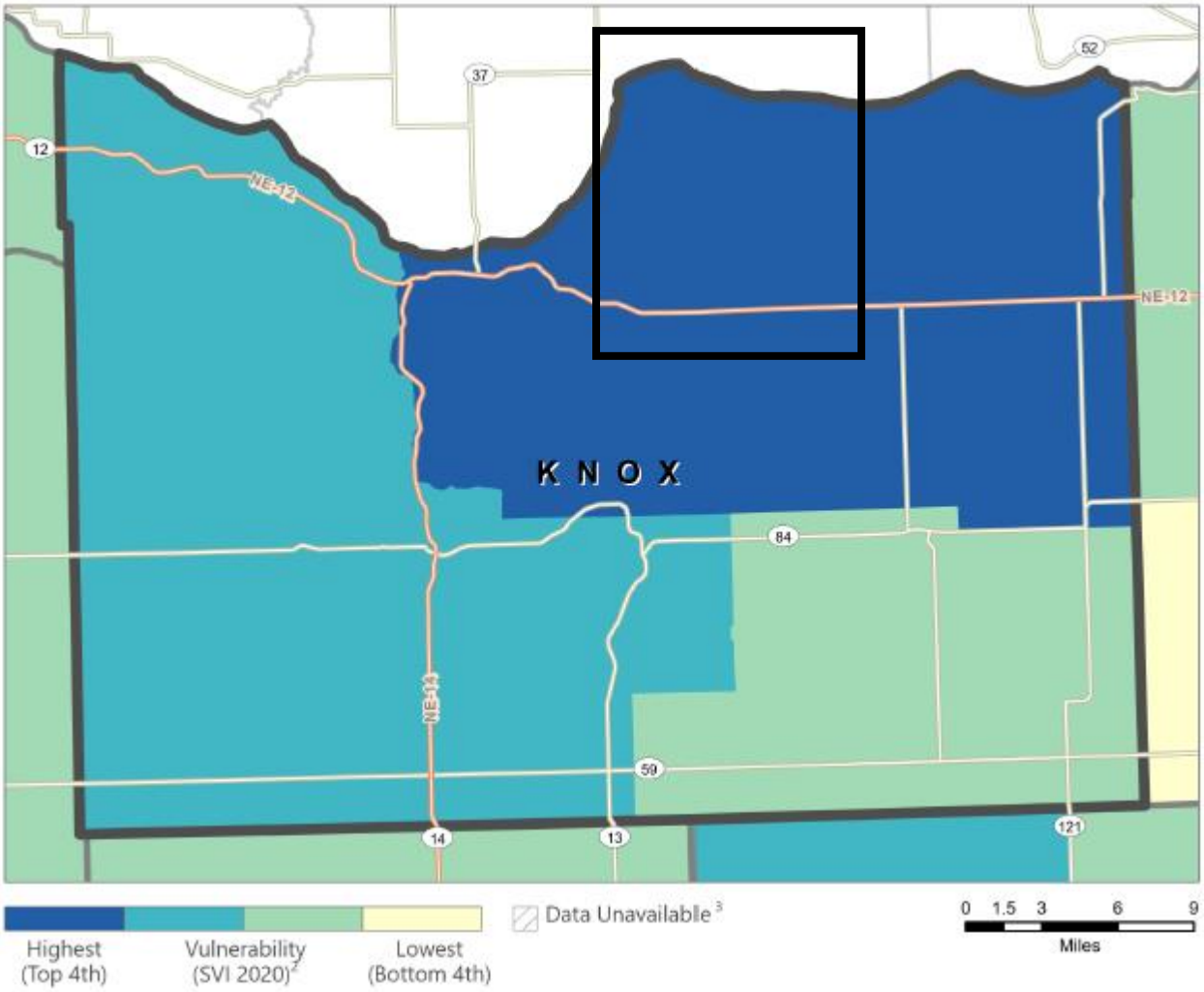
Every community must prepare for and respond to a hazard event, whether a natural disaster like a tornado or disease outbreak, or a human-made event such as a harmful chemical spill. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. The US Center for Disease Control (CDC) Social Vulnerability Index (CDC SVI) uses 15 U.S. census variables to help local officials identify communities that may need support before, during, or after disasters.

The Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a

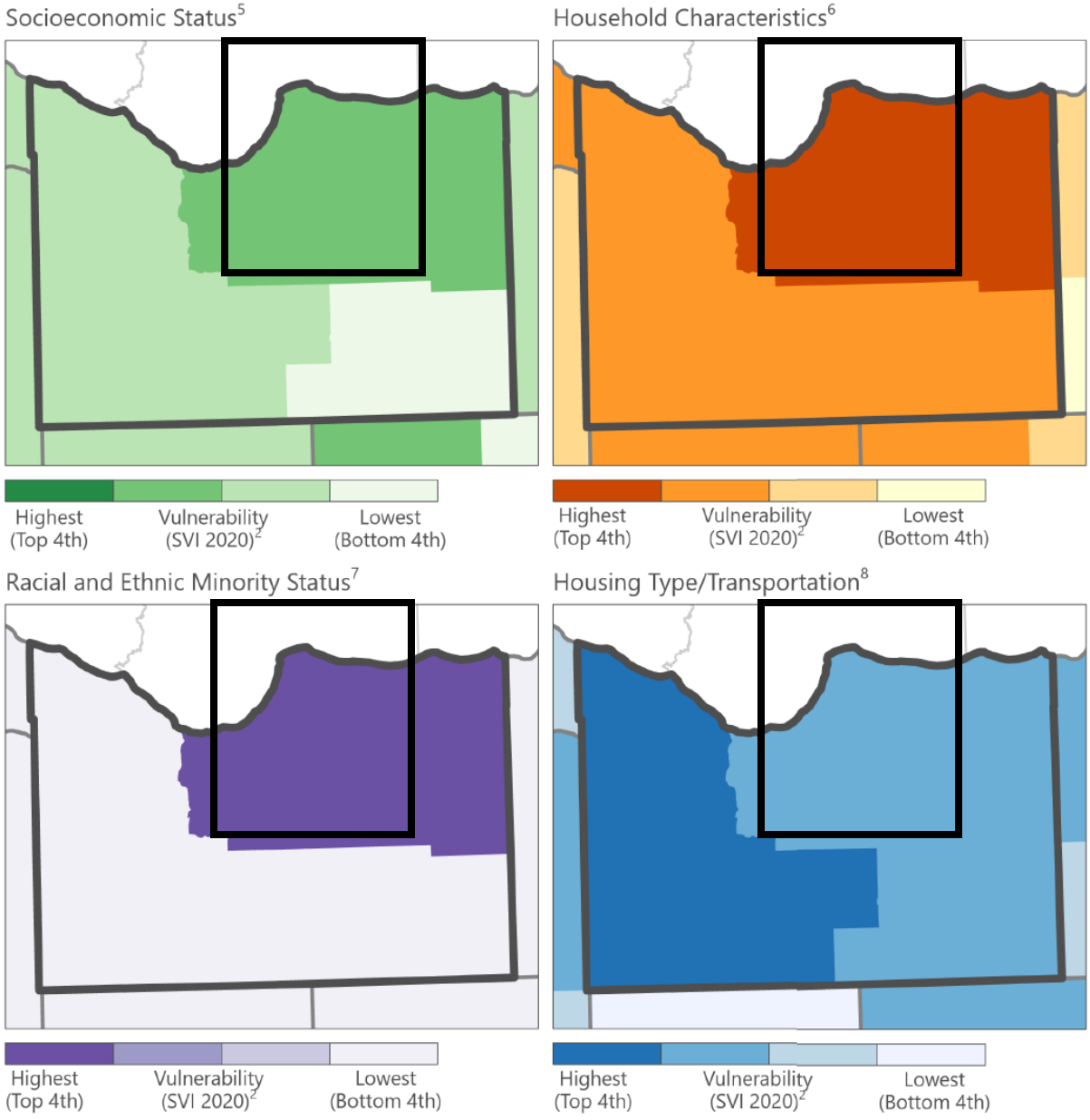
hazardous event. CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes are shown in the figure below. The overall SVI map is shown in Figure 4-3; the socioeconomic SVI, household composition SVI, minority and language SVI, and the housing and transportation SVI for the census tracts in and around the SSN are shown in Figure 4-4.

Figure 4-3 Santee Sioux Nation – Overall Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 07/10/2023

Figure 4-4 Santee Sioux Nation –Vulnerability by Theme



Data Sources: [2]CDC/ATSDR/GRASP, U.S. Census Bureau, Esri® StreetMapTM Premium.
Notes: [1]Overall Social Vulnerability: All 16 variables. [3]Census tracts with 0 population. [4]The CDC/ATSDR SVI combines percentile rankings of US Census American Community Survey (ACS) 2016-2020 variables, for the state, at the census tract level. [5]Socioeconomic Status: Below 150% Poverty, Unemployed, Housing Costs Burden, No High School Diploma, No Health Insurance. [6]Household Characteristics: Aged 65 and Older, Aged 17 and Younger, Civilian with a Disability, Single-Parent Household, English Language Proficiency. [7]Race/Ethnicity: Hispanic or Latino (of any race); Black and African American, Not Hispanic or Latino; American Indian and Alaska Native, Not Hispanic or Latino; Asian, Not Hispanic or Latino; Native Hawaiian and Other Pacific Islander, Not Hispanic or Latino; Two or More Races, Not Hispanic or Latino; Other Races, Not Hispanic or Latino. [8]Housing Type/Transportation: Multi-Unit Structures, Mobile Homes, Crowding, No Vehicle, Group Quarters.
Projection: NAD 1983 StatePlane Nebraska FIPS 2600 Feet.
References: Flanagan, B.E., et al., A Social Vulnerability Index for Disaster Management. *Journal of Homeland Security and Emergency Management*, 2011. 8(1).
CDC/ATSDR SVI web page: https://www.atsdr.cdc.gov/placeandhealth/svi/index.html.

THMPC Input

The Tribe noted that there are many members of the SSN that fall in the following categories:

- Over 65

- Under 5
- Low-income
- Mobility Impaired

These members may require additional assistance during hazard events.

Future Development

The SSN noted that there is a future development area planned, but that the future development most likely will not start within the life cycle of this THMP. The area is adjacent to the Village of Santee. This can be seen on Figure 4-5. Because it is not likely to be developed during the THMP life cycle, it is not discussed in the hazard sections below.

Figure 4-5 SSN – Possible Future Development Area

Source: SSN

4.3 Hazard Profiles and Vulnerability Assessment

Requirement §201.7(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Requirement §201.7(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.7(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.7(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.7(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The natural hazards identified in Section 4.1 Hazard Identification, are profiled individually in this section. The Hazard Profiles set the stage for the Vulnerability Assessment, where the vulnerability or exposure is quantified, as data allows, for each of the identified hazards.

Hazard Profiles Methodology

Each hazard is profiled in the following format:

- **Hazard/Problem Description**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the Tribe. Where known, this includes information on the hazard extent, location, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- **Past Occurrences**—This section contains information on historical incidents, including impacts where known. Hazard research, searchable databases, historical incident worksheets, and other input from the THMPC were used to capture information on past occurrences.
- **Probability of Future Occurrence**—The frequency of past events is used in this section to gauge the probability of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a experiencing a drought in any given year). The probability of future occurrences is categorized into one of the following classifications:
  - ✓ **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year.
  - ✓ **Likely**—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.

- ✓ **Occasional**—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
- ✓ **Unlikely**—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

- **Climate Change**—This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

Vulnerability Assessment Methodology

With the Tribe's hazards identified and profiled, a vulnerability assessment was conducted to describe the vulnerability and impact that each hazard would have on the Tribe. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to identified hazards and estimates potential losses.

An estimate of the vulnerability of the Tribe to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of assets subject to the identified hazard can be counted and their values, if known, tabulated. Other information can be collected in regard to the hazard area, such as the location of populations, critical facilities, historic structures, and valued natural resources. Together, this information conveys the impact, or vulnerability, of the Tribe to that hazard.

The vulnerability assessment identified three hazards in the Tribe for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These three hazards are flood (1% and 0.2% annual chance), hazardous materials transport, and wildfire. These hazards were analyzed using GIS. For these three hazards, the following elements were inventoried for each community, to the extent possible, to quantify vulnerability in identified hazard areas:

- General vulnerability and hazard-related impacts, including impacts to life, safety, and health
- Values at risk (i.e., types, numbers, and value of land and improvements)
- Critical facilities at risk
- Overall community impact

- Future development/development trends within the identified hazard area

The vulnerability and potential impacts from the seven hazards that do not have specific mapped areas nor the data to support additional vulnerability analysis are discussed in more general terms. These include:

- Dam Failure
- Drought and Water Shortage
- Landslide
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms
- Severe Weather: High Winds and Tornadoes

Power Outages/Failure: A Common Vulnerability of all Hazards

An additional impact or vulnerability common to most all hazards is power outage or power failure. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. Electric power disruptions can be generally grouped into two categories: intentional and unintentional.

Intentional Disruptions

There are four types of intentional disruptions:

- **Planned**: Some disruptions are intentional and can be scheduled based on maintenance or upgrading needs.
- **Unscheduled**: Some intentional disruptions must be done "on the spot." in response to an emergency.
- **Demand-Side Management**: Some customers (i.e., on the demand side) have entered into an agreement with their utility provider to curtail their demand for electricity during periods of peak system loads.
- **Load Shedding**: When the power system is under extreme stress due to heavy demand and/or failure of critical components, it is sometimes necessary to intentionally interrupt the service to selected customers to prevent the entire system from collapsing, resulting in rolling blackouts.

The Southwest Power Pool (SPP) is tasked with managing the power distribution grid that supplies most of Nebraska (and a much larger region), except in areas served by municipal utilities. SPP is thus the entity that coordinates flow of electrical supply in the State. Rotating outages and/or blackouts can occur due to losses in transmission or generation and/or extremely severe temperatures that lead to heavy electric power consumption. SPP's outage coordinators work hand-in-hand with its members to manage the impacts of forced outages, coordinate future maintenance and system expansion, and make smart decisions that benefit our entire region.

Unintentional Disruptions

Unintentional or unplanned disruptions are outages that come with essentially no advance notice. This type of disruption can be the most problematic. The following are categories of unplanned disruptions:

- Accident by the utility, utility contractor, or others
- Malfunction or equipment failure
- Equipment overload (utility company or customer)
- Reduced capability (equipment that cannot operate within its design criteria)
- Tree contact other than from storms
- Vandalism or intentional damage
- Weather, including lightning, wind, earthquake, flood, and broken tree limbs taking down power lines
- Wildfire that damages transmission lines

Climate Change and Power Outages/Failures (Energy Shortage)

Changing climate is expected to bring more frequent and intense natural disasters. Key climate parameters are starting to move outside of historically observed variability at a rate that makes historical data a poor predictor of future climate. Changes in temperatures, precipitation patterns, and extreme events have the potential to decrease the efficiency of thermal power plants and substations, decrease the capacity of transmission lines, render hydropower less reliable, spur an increase in electricity demand, and put energy infrastructure at risk of flooding.

With climate warming, higher costs from increased demand for cooling in the summer are expected to outweigh the decreases in heating costs in the cooler seasons. Hotter temperatures in Nebraska will mean more energy (typically measured in "cooling-degree days") needed to cool homes and businesses both during heat waves and on a daily basis, during the daytime peak of the diurnal temperature cycle.

Secondary impacts of energy shortages are most often felt by vulnerable populations. For example, those who rely on electric power for life-saving medical equipment, such as respirators, are extremely vulnerable to power outages. Also, during periods of extreme heat emergencies, the elderly and the very young are more vulnerable to the lack of or loss of cooling systems requiring power sources.

Additional impacts from a power disruption affect remote areas like the Santee Sioux Nation. This can affect evacuation messaging and coordination difficulties, and a reduction in firefighting capabilities due to lack of water access in more remote areas (especially for those on wells). Past occurrences of power outage are included in the Past Occurrences section of each of the hazard sections below.

Data Sources

The following data sources formed the basis for the Hazard Profile and Vulnerability Assessment portion of the Plan:

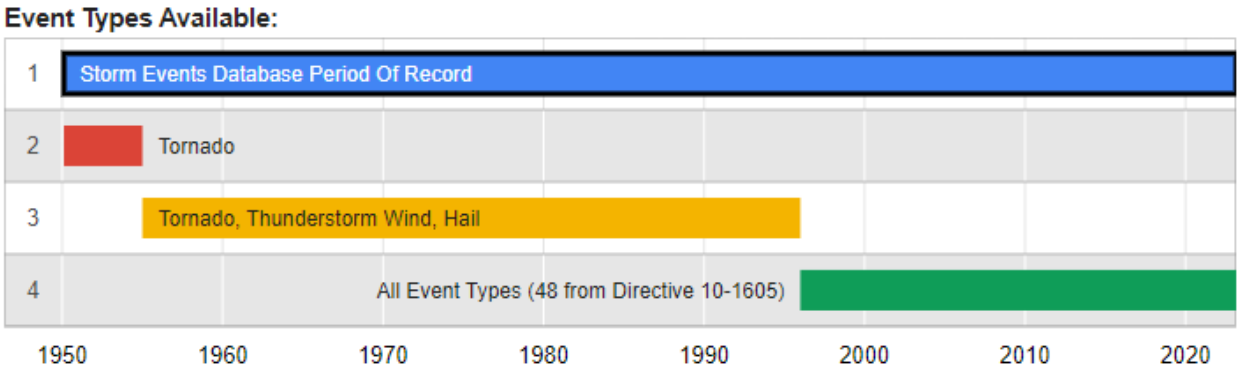
- 2011 Santee Sioux Nation Community Wildfire Protection Plan
- 2020 Lower Elkhorn Natural Resource District Local Hazard Mitigation Plan
- 2020 North Central Public Power District Annex to the Nebraska Hazard Mitigation Plan
- 2021 Nebraska State Hazard Mitigation Plan

- 2023 Tri-County (including Knox County) Hazard Mitigation Plan
- Environmental Protection Agency
- FEMA
- FEMA Disaster Declaration Database
- Know County FEMA DFIRM (10/2/2015)
- Knox County Flood Insurance Study (10/2/2015)
- National Drought Mitigation Center
- National Inventory of Dams
- National Oceanic and Atmospheric Administration National Climatic Data Center Storm Events Database
- National Performance of Dams Program
- Nebraska Department of Natural Resources
- Nebraska Department of Transportation
- Nebraska Forest Service
- Nebraska Forest Service Wildfire Risk Explorer
- NOAA Storm Prediction Center
- North Central Public Health District
- SSN Community Wildfire Protection Plan
- THMPC input
- U.S. Occupational Safety and Health Administration
- Union for Concerned Scientists
- United States Geological Survey
- University of Nebraska-Lincoln - Understanding and Assessing Climate Change: Implications for Nebraska
- US Center for Disease Control
- US Department of Transportation
- US Department of Transportation Pipeline and Hazardous Materials Safety Administration
- US Drought Monitor
- US National Weather Service
- US National Weather Service XMAC website
- Vaisala National Lightning Detection Network
- World Health Organization

4.3.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs throughout the Tribe and Knox County as localized storms that bring heavy rain and strong winds. NOAA's National Climatic Data Center (NCDC) has been tracking severe weather since 1950. Their Storm Events Database contains data on the following events shown on Figure 4-6.

Figure 4-6 NCDC Storm Events Database Period of Record



Event Types Available:

Add more info about event types here. Link to collections page/tab when referencing data collection source.

1. Tornado: From 1950 through 1954, only tornado events were recorded.

2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.

3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

Source: NCDC

This database contains severe weather events that occurred in Knox County between January 1, 1950, and January 31, 2023. These events affected the County, and most likely had some effect on the Tribe as well. Table 4-10 summarizes these events for Knox County.

*Table 4-10 Knox County NCDC Storm Events 1/1/1950-1/31/2023**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	16	0	0	0	0	$0	$0
Cold/Wind Chill	45	0	0	0	0	$0	$0
Drought	13	0	0	0	0	$0	$0
Excessive Heat	1	0	0	0	0	$0	$0
Extreme Cold/Wind Chill	9	0	0	0	0	$0	$0
Flash Flood	17	0	0	0	0	$79,000	$10,000
Flood	21	0	0	0	0	$151,000	$0
Funnel Cloud	1	0	0	0	0	$0	$0
Hail	294	0	0	5	0	$1,575,000	$4,230,000
Heat	7	0	0	0	0	$0	$0

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Heavy Rain	2	0	0	0	0	$0	$0
Heavy Snow	13	0	0	0	0	$0	$0
High Wind	20	0	0	1	0	$53,000	$0
Ice Storm	3	0	0	0	0	$0	$0
Lightning	2	0	0	0	0	$500	$0
Thunderstorm Wind	132	0	0	0	0	$559,000	$0
Tornado	46	1	0	107	0	$5,732,560	$0
Winter Storm	49	0	0	0	0	$3,500,000	$0
Winter Weather	7	0	0	0	0	$0	$0
Total	**698**	**1**	**0**	**113**	**0**	**$11,650,060**	**$4,240,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of the Tribe and outside of Knox County.

The NCDC table above summarizes severe weather events that occurred in greater Knox County. Only a few of the events actually resulted in state and federal disaster declarations. It is interesting to note that different data sources capture different events during the same time period, and often display different information specific to the same events. While the HMPC recognizes these inconsistencies, they see the value this data provides in depicting SSN's "big picture" hazard environment.

As previously mentioned, many of Knox County's federal disaster declarations have been a result of severe weather. For this Plan, severe weather is discussed in the following subsections:

- Extreme Heat
- Heavy Rains and Storms
- High Winds and Tornadoes
- Winter Storms

The remainder of the hazards follow alphabetically.

4.3.2. Severe Weather: Extreme Heat

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. According to the CDC, in a normal year, about 658 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000

people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. According to NASA, 2022 was one of the hottest years on record. Extreme heat can also significantly impact natural resources and can increase the risk of wildfires.

Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds a level at which the body can remove it, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise, and heat-related illness may develop. Elderly persons, small children, low-income households, individuals with chronic medical issues, outdoor workers, and even athletes are particularly susceptible to heat issues.

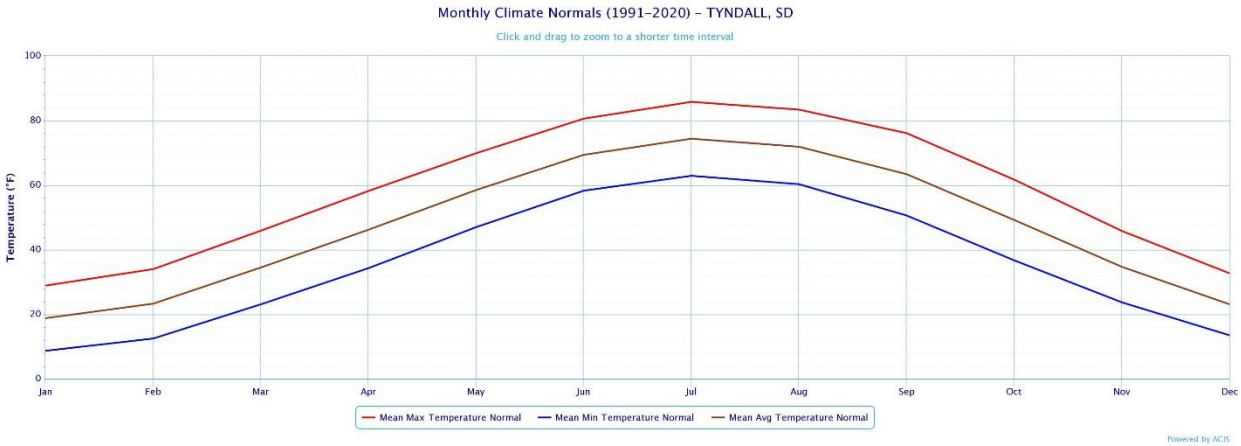
Location and Extent

Extreme heat events occur on a regional basis. The Tribe has many extreme heat days due to its location. All portions of the Tribe are at risk to extreme heat. The National Weather Service (NWS) maintains data on weather normal and extremes in the western United States. The closest station with the longest period of record was chosen. Tyndall, South Dakota records back to 1893 and is located just north of the Tribe. NWS data for the Tribe is summarized below.

Tyndall, SD NWS Station

According to the NWS, monthly average maximum temperatures in the warmest months (June through September) range from the mid-70s to upper-80s. The highest recorded daily extreme was 115°F on July 17, 1936. Figure 4-7 shows the average daily high temperatures and extremes for the SSN. Table 4-11 shows the record high temperatures for the SSN.

Figure 4-7 Daily Temperature Averages and Extremes, 1991-2020



Source: National Weather Service XMAC site. Retrieved 7/11/2023.

Table 4-11 Record High Temperatures (Descending) 1942 to 2023

Temperature	Date
115.0°	7/17/1936
113.0°	7/24/1940

Temperature	Date
113.0°	8/24/1936
113.0°	7/16/1936
112.0°	8/15/1937
112.0°	7/24/1936
112.0°	7/22/1936
112.0°	7/5/1936
112.0°	8/4/1934
111.0°	7/4/1936

Period of record: 1/1/1893 to 7/13/2023

Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Table 4-12.

Table 4-12 National Weather Service HeatRisk Categories

Category	Level	Meaning
Green	0	No Elevated Risk
Yellow	1	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	2	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	3	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	4	Very High Risk for entire population due to long duration heat, with little to no relief overnight

Source: National Weather Service

The NWS office in Omaha can issue the following heat-related advisory as conditions warrant.

- **Heat Advisories** are issued during events where the HeatRisk is on the Orange/Red threshold (Orange will not always trigger an advisory)
- **Excessive Heat Watches/Warnings** are issued during events where the HeatRisk is in the Red/Magenta threshold

Extreme heat is made worse when it is experienced over a longer duration of time.

Past Occurrences

Disaster Declaration History

There have been no FEMA or Cal OES disaster declarations in Knox County related to extreme heat, as shown in Table 4-4.

NCDC Events

The NCDC has tracked heat and extreme heat events since 1996 for Knox County. 8 events were recorded as shown in Table 4-13. More events have likely occurred, without being reported to the NCDC database. Specifics on damages in the Tribe were not included in the database.

Table 4-13 Santee Sioux Nation – Knox County Heat Events 1/1/1996-1/31/2023*

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Excessive Heat	1	0	0	0	0	$0	$0
Heat	7	0	0	0	0	$0	$0
Total	**8**	**0**	**0**	**0**	**0**	**$ 0**	**$ 0**

Source: NCDC

*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the Tribe or Knox County.

Tribal Hazard Mitigation Planning Committee Events

The HMPC noted that it gets hot and humid every year. For five days in August of 2023 the temperatures exceeded 105°F with a heat index of over 115105°F. No events where deaths or injuries occurred could be recalled. The Tribe noted that other effects can be felt during times of drought (discussed in Section 4.3.7) that can contribute to the wildfire hazard (discussed in Section 4.3.11) and PSPS events.

Probability of Future Occurrences

Highly Likely—Extreme heat is likely to continue to occur annually in the Tribe. According to the NWS, temperatures at or above 90°F occur on multiple summer days in the SSN each year.

Climate Change and Extreme Heat

The Union for Concerned Scientists released a report in July 2019 titled *Killer Heat in the United States: Climate Choices and the Future of Dangerously Hot Days* which included predictions for extreme heat events in the future dependent on future climate actions. Table 4-14 summarizes those findings for Knox County.

Table 4-14 Santee Sioux Nation – Extreme Heat Predictions for Days over 100°F

Jurisdiction	Midcentury Prediction 2036-2065 (Days per year)			Late Century Prediction 2036-2065 (Days per year)		
	Historical	Slow Action	No Action	Slow Action	No Action	Rapid Action
Knox County	5	21	29	25	54	21

Source: Union of Concerned Scientists

Vulnerability Assessment

Vulnerability—Medium

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the SSN. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. Extreme heat dries out vegetation on and near the Reservation, creating greater risks from regional wildfires.

Vulnerability to and Impacts from Extreme Heat

Vulnerable populations are at the greatest risk to the effects of extreme heat. Vulnerable populations to extreme heat include:

- Those unable to afford cooling systems during extreme heat events
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

In addition to vulnerable populations, pets and livestock are at risk to extreme heat.

The most common impacts of drought affect the agricultural sector. The 2021 Nebraska State Hazard Mitigation Plan noted that drought conditions during certain parts of the crop growth cycles can be particularly impactful as growth can be stunted or plants die off resulting in lower yields. Impacts on agriculture vary depending on the time of year, period of precipitation, amount of stored soil moisture, type of crop, stage of growth, and meteorological measures (i.e., temperature, humidity, and wind). These impacts can affect the SSN as it is surrounded by agricultural land. Economic losses in farm country can have economic impacts in the SSN.

Extreme heat normally does not generally impact structures, but Tribal staff working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. A brownout is a reduction in or restriction on the availability of electrical power in a particular area. When brownouts happen during extreme heat, the risk of heat related illnesses and deaths increases. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

While structures are generally not affected during extreme heat events, Park areas and assets may be vulnerable. These include turfed areas; landscape, trees that are already compromised from an extended drought, and habitat areas. Other assets that can also be affected by extreme heat include water and sewer utilities. Backup power sources to these critical facilities are in place to reduce possible impacts from these systems going offline.

Extreme heat may also cause drought-like conditions. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Drought is discussed further in Section 4.3.7 and wildfire in Section 4.3.11.

Future Development

Future development in the Tribe will take extreme heat into account. The SSN will continue to work with the US Bureau of Indian Affairs (BIA) and the US Housing and Urban Development (HUD) to consider extreme heat when designing new facilities, including incorporating techniques for climate or heat proofing structures. The SSN is working with North Central Public Power District on adding additional power lines to ensure a consistent power source for air conditioning systems of Tribal residents.

4.3.3. Severe Weather: Heavy Rains and Storms

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Storms in the SSN are generally characterized by heavy rain often accompanied by strong winds and infrequent lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the SSN falls mainly in the fall, winter, and spring months.

Heavy Rain and Storms

The NWS reports that storms and thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at Earth's surface and causes strong winds associated with thunderstorms.

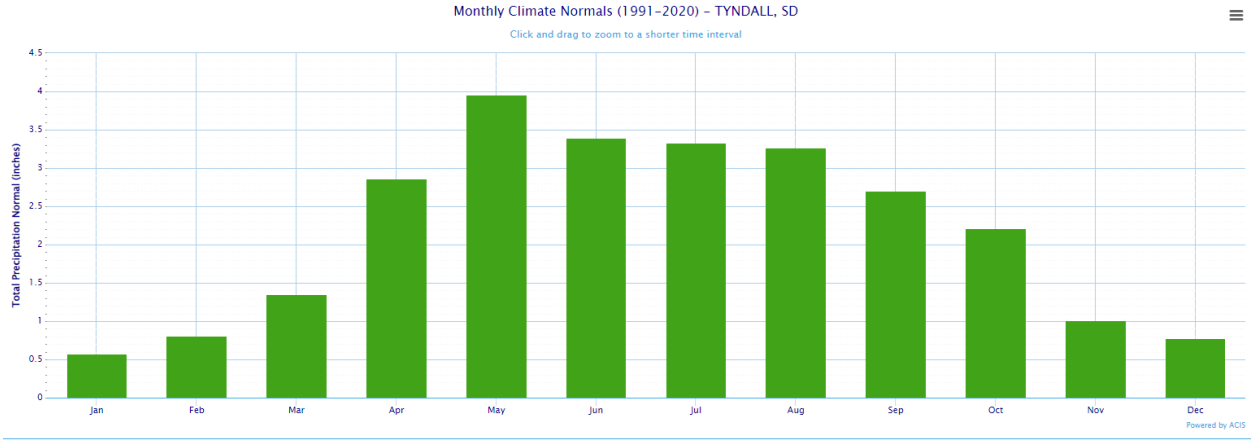
Location and Extent of Heavy Rains and Storms

Heavy rain events occur on a regional basis. Rain and storms can occur in any location of the Tribe. All portions of the SSN are at risk to heavy rains. Most of these rains occur during the winter months, as discussed below. There is no scale by which heavy rain and storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of heavy rain and storms in Nebraska is often short, ranging from minutes to hours. NWS data from the closest station with the longest period of record for the Tribe is summarized below.

Tyndall, SD NWS Station

According to the NWS, average annual precipitation in and around the Tribe since 1991 averages 26.24 inches. Figure 4-8 shows the average precipitation by month for the Tribe.

Figure 4-8 Santee Sioux Nation Precipitation Averages – 1991-2022

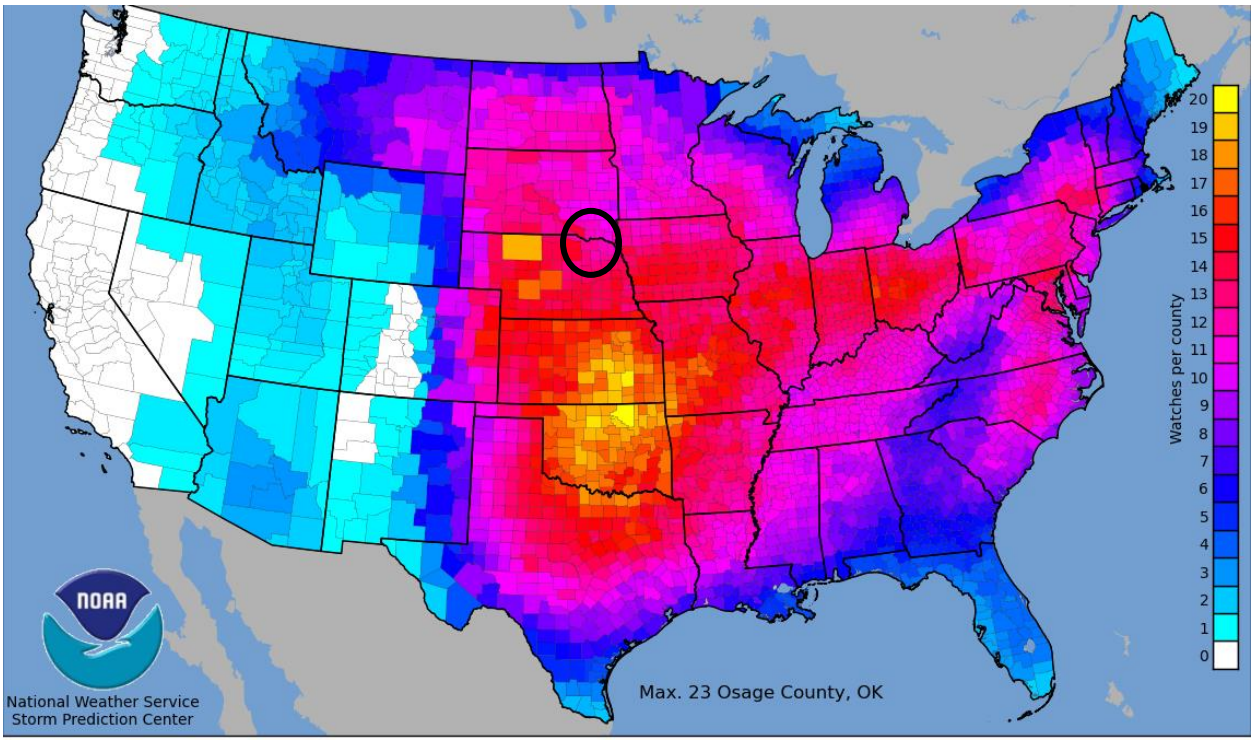


Month	Total Precipitation Normal (inches)
January	0.57
February	0.81
March	1.35
April	2.86
May	3.96
June	3.39
July	3.33
August	3.27
September	2.70
October	2.21
November	1.01
December	0.78
Annual	26.24

Source: National Weather Service XMAC site. Retrieved 7/11/2023.

The NOAA Storm Prediction Center tracks thunderstorm watches in the United States on a county basis. Figure 4-9 shows thunderstorm watches in and around the Tribe and the United States for a 20-year period between 1993 and 2022.

Figure 4-9 Santee Sioux Nation – Average Thunderstorm Watches per Year (1993 to 2022)



Source: NOAA Storm Prediction Center. Retrieved on 7/11/2023.

Hail

Hail can occur throughout the SSN during storm events. Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

Location and Extent of Hail

While rare, hail events can occur in any location of the Tribe. All portions of the Tribe are at risk to hail. There is no scale in which to measure hail, other than hail stone size. The National Weather Service classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-15 indicates the hailstone measurements utilized by the National Weather Service.

Table 4-15 Hailstone Measurements

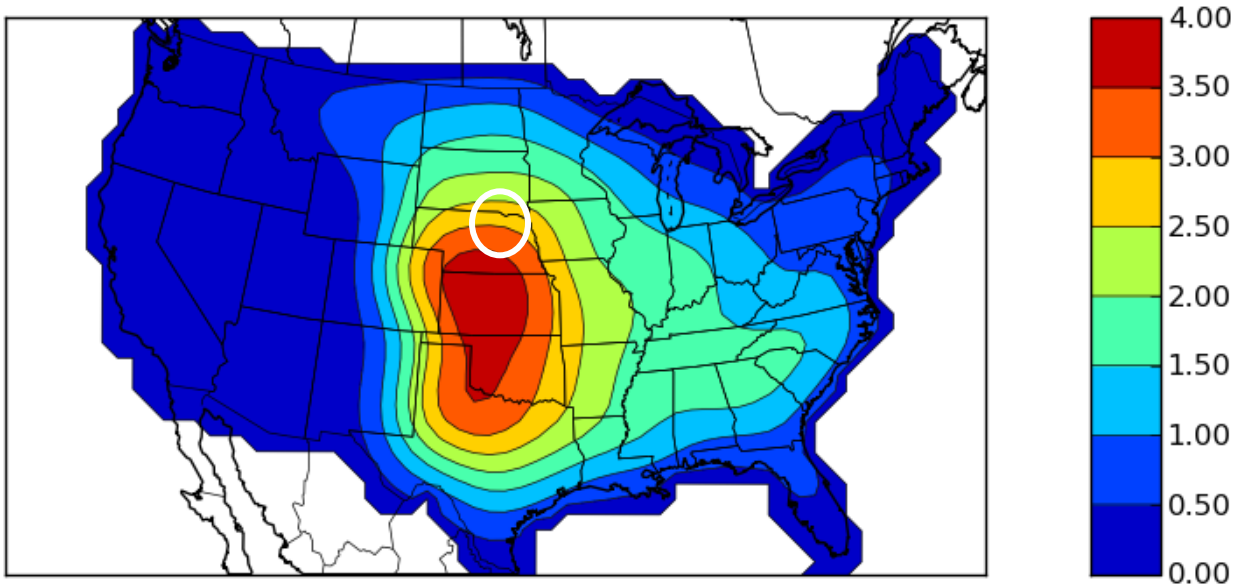
Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel

Average Diameter	Corresponding Household Object
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

The speed of onset of hail can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms that can cause hail in Nebraska is often short, ranging from minutes to hours. Hail events last shorter than the duration of the total thunderstorm. The National Weather Service tracks hail events. Figure 4-10 shows the average days each year where hail of greater than 1" in diameter occurred during a 20-year period from 1990 to 2009. As shown in the figure, hail is rare in the SSN.

Figure 4-10 Santee Sioux Nation – Average Hail Days per Year (1990 to 2009)



Source: National Weather Service. Map retrieved 7/11/2023.

Lightning

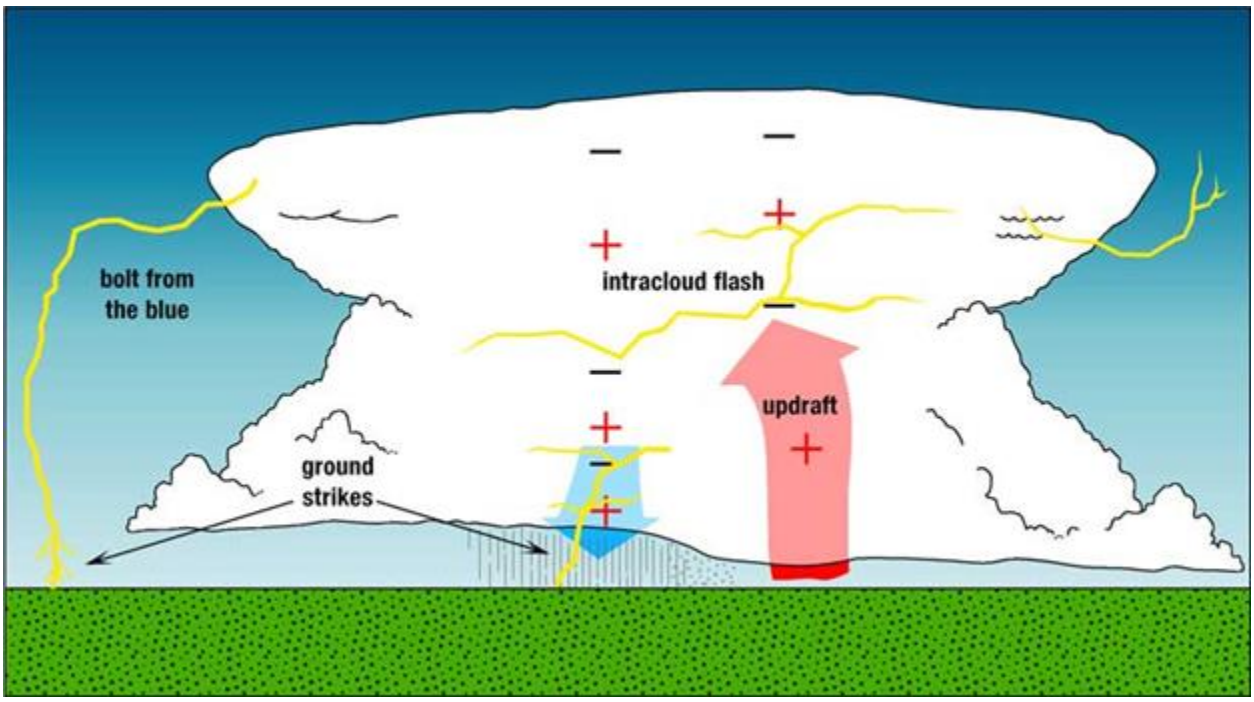
Lightning, while somewhat rare in the SSN, can occur both during and outside of storm events. Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects

can be struck directly, which may result in an explosion, burn, or total destruction. Additionally, damage may be indirect, when the current passes through or near an object, which generally results in less damage.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-11). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-11 Cloud to Ground Lightning



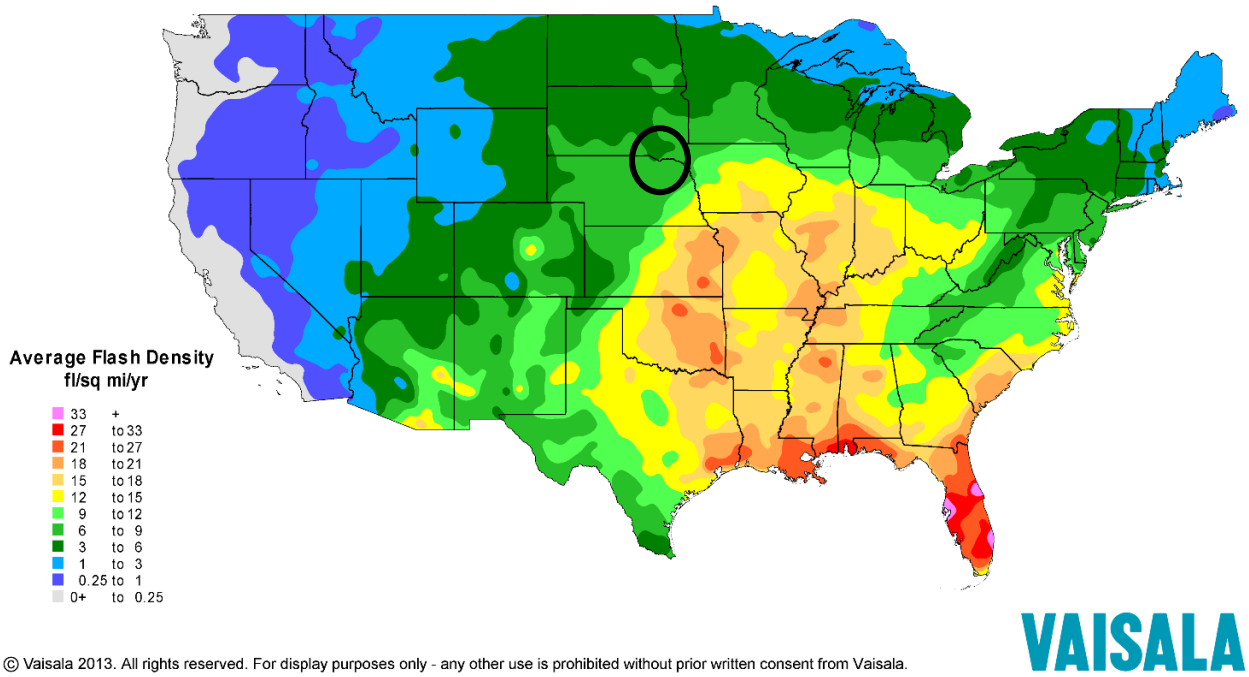
Source: National Weather Service

Location and Extent of Lightning

Lightning events can occur in any location of the SSN and are often associated with thunderstorms, but also may occur outside of rain, often referred to as dry lightning events. All portions of the SSN are at risk to lightning. The speed of onset of thunderstorms (that cause lightning) can be short, and the duration is often short as well, generally ranging from minutes to hours. Vaisala maintains the National Lightning Detection

Network. It tracks cloud to ground lightning incidences in the United States. Figure 4-12 shows lightning incidences in the SSN and the rest of the United States from 1997 to 2012.

Figure 4-12 Santee Sioux Nation – Lightning Incidence Map 1997 to 2012



Source: Vaisala National Lightning Detection Network. Retrieved 7/11/2023.

Past Occurrences

Disaster Declaration History

A search of FEMA disaster declarations turned up multiple events. Heavy rains and storms have caused flooding in Knox County. Events where heavy rain and storms (including the resultant flooding) resulted in a federal disaster declaration are shown in Table 4-16.

Table 4-16 Knox County – Disaster Declarations from Heavy Rain and Storms 1950-2023

Disaster Type	Federal Declarations	
	Count	Years
Flood (with heavy rain and storms)	14	1967,1971 (twice), 1978, 2003, 2005, 2006, 2007, 2010 (twice), 2011 (twice), 2019, 2022

Source: FEMA

NCDC Events

The NCDC data recorded 298 hail, heavy rain, and lightning incidents for Knox County since 1955. A summary of these events is shown in Table 4-17. Events happening near the SSN are discussed below the table. Additional heavy rain events are also included in the NCDC Events of the Flood: 1%/02% Annual Chance (see Section 4.3.8)

*Table 4-17 Knox County NCDC Storm Events 1/1/1955-1/31/2023**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Hail	294	0	0	5	0	$1,575,000	$4,230,000
Heavy Rain	2	0	0	0	0	$0	$0
Lightning	2	0	0	0	0	$500	$0
Total	**298**	**0**	**0**	**5**	**0**	**$1,575,500**	**$4,230,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of the Tribe and outside of Knox County.

6/25/2002 – Hail up to nickel size lasted 20 minutes near Santee.

6/9/2003 – No event narrative, happened at 5:02 pm, 5:18 pm, and 6:17 pm.

5/29/2004 – No event narrative.

4/24/2010 – A large upper-level low pressure system caused scattered thunderstorms to develop during the late morning and early afternoon of April 24th. The storms then moved west and southwest in response to the upper circulation center...and a few of them produced large hail.

5/29/2011 – Thunderstorms developed north of a warm front that was in southeast Nebraska and southwest Iowa during the evening of 5/29. Warm mid-level temperatures limited the coverage of the storms early in the evening. 1 inch hail sizes were reported.

6/21/2013 – The hail was mostly pea to dime-size, but a few were around quarter-size. Scattered thunderstorms developed in northeast Nebraska during the evening of June 21. The storms developed north of an outflow boundary that had pushed south across northeast Nebraska. One of the storms dropped quarter-size hail in far northeast Nebraska before moving into South Dakota.

7/5/2015 – A few isolated thunderstorms developed in the early morning hours of July 5th along the South Dakota and Nebraska border.

8/16/2016 –Thunderstorms developed in two areas on the evening of August 16th. The first area was over northeast Nebraska along a weak stalled boundary, and the second area was along an outflow boundary over southeast Nebraska. The combination of favorable instability and shear in both areas allowed for marginal supercell structures and severe weather, mainly in the form of large hail. The thunderstorms dissipated by late evening with the loss of surface heating.

8/7/2019 – An isolated supercell thunderstorm moved out of South Dakota and into Knox County during the late evening hours. Power lines and trees were blown down. Hail of unknown size was also reported.

7/17/2020 – A storm cell in Knox County produced 1.5-inch hail. The public reported quarter size hail at the Santee Tribe Museum. Another report said it was just smaller than a golf ball.

Tribal Hazard Mitigation Planning Committee Events

The HMPC noted that there are annual events of heavy rains and storms causing issues in the Tribe, including flooding. These are discussed in the Flood (Section 4.3.8) past occurrences.

One issue not related to flooding occurred in May of 2022. On the last day of school in 2022, there was a large storm that caused power outages across the County. Locations were without power for between one and four days. North Central Public Power District noted that they had a transmission line and a distribution line that was damaged. These were repaired at a cost of around $450,000.

Probability of Future Occurrences

Highly Likely – Based on NCDC data and HMPC input, 298 hail, heavy rain, and lightning incidents over a 68-year period (1955-2023) equates to a severe storm event every year. As noted, this database likely doesn't capture all heavy rain, hail, and lightning events. Severe weather, including heavy rains and storms, is a well-documented seasonal occurrence that will continue to occur often in the SSN.

Climate Change and Heavy Rains and Storms

For extreme events like severe thunderstorms there is considerable uncertainty about how projected changes in the climate will affect these events. However, a 2014 study titled Understanding and Assessing Climate Change: Implications for Nebraska noted that severe thunderstorms will continue to be a normal feature for Nebraska. Projected trends for precipitation and temperature indicate more favorable conditions for severe thunderstorms to develop more readily and grow larger. According to the Fourth National Climate Assessment, modeling studies consistently suggest that the frequency and intensity of severe thunderstorms in the United States could increase as climate changes. There are also some suggestions in the models that the atmosphere will become more favorable to severe thunderstorm development and increased intensity. It is unlikely that hail will become more common in the SSN. The amount of lightning is also not projected to change.

Vulnerability Assessment

Vulnerability—Medium

According to historical hazard data, heavy rains and storms are an annual occurrence in the SSN. Impacts can be felt by both the population of the Tribe as well as the structures that have been built.

Vulnerability to and Impacts from Heavy Rains and Storms

Short-term, heavy storms can cause both widespread flooding as well as localized drainage issues throughout the SSN. Inadequate drainage can contribute to flooding, erosion, and in a few areas, landslides in the SSN. In addition to the flooding that often occurs during these storms, when combined with saturated ground conditions, strong winds can down very mature trees and cause power outages.

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: downed trees, damaged utility structures and infrastructure; power outages; road damage and blockages; and lightning strikes to critical infrastructure and people. Lightning

can also cause wildfires and urban fires to occur. Actual damage associated with the primary effects of severe weather has been somewhat limited. It is the secondary hazards caused by severe weather, such as floods and erosion, that have had the greatest impact on the Tribe. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this Plan (Section 4.3.8 Flood: 1%/0.2% Annual Chance and Section 4.3.5 Dam Failure,.

Future Development

Future development in the SSN will take heavy rains and storms (and the localized flooding they can cause) into account. The SSN will continue to work with the BIA and HUD to build any new facilities to current building codes. Building codes (like the International Building Code) take hazards like rainstorms and winds into account during the construction process.

4.3.4. Severe Weather: High Winds and Tornadoes

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

High Winds

High winds can cause significant property and resource damage, threaten public safety, and have adverse economic impacts from facility closures and power loss. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms.

Straight-line (i.e., non-tornadic) winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snowstorms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires, as well as contributing to fire weather conditions resulting in red flag days. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees.

Location and Extent

The entire SSN is subject to significant, non-tornadic (straight-line) winds. Each area of the SSN is at risk to high winds. Magnitude of winds is measured often in speed and damages. The speed of onset of both thunderstorm winds and high winds outside of thunderstorm events can be short or prolonged, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorm winds in Nebraska is often short, ranging from minutes to hours, but can occur for longer periods. The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort wind force scale. Figure 4-13 shows the Beaufort wind scale.

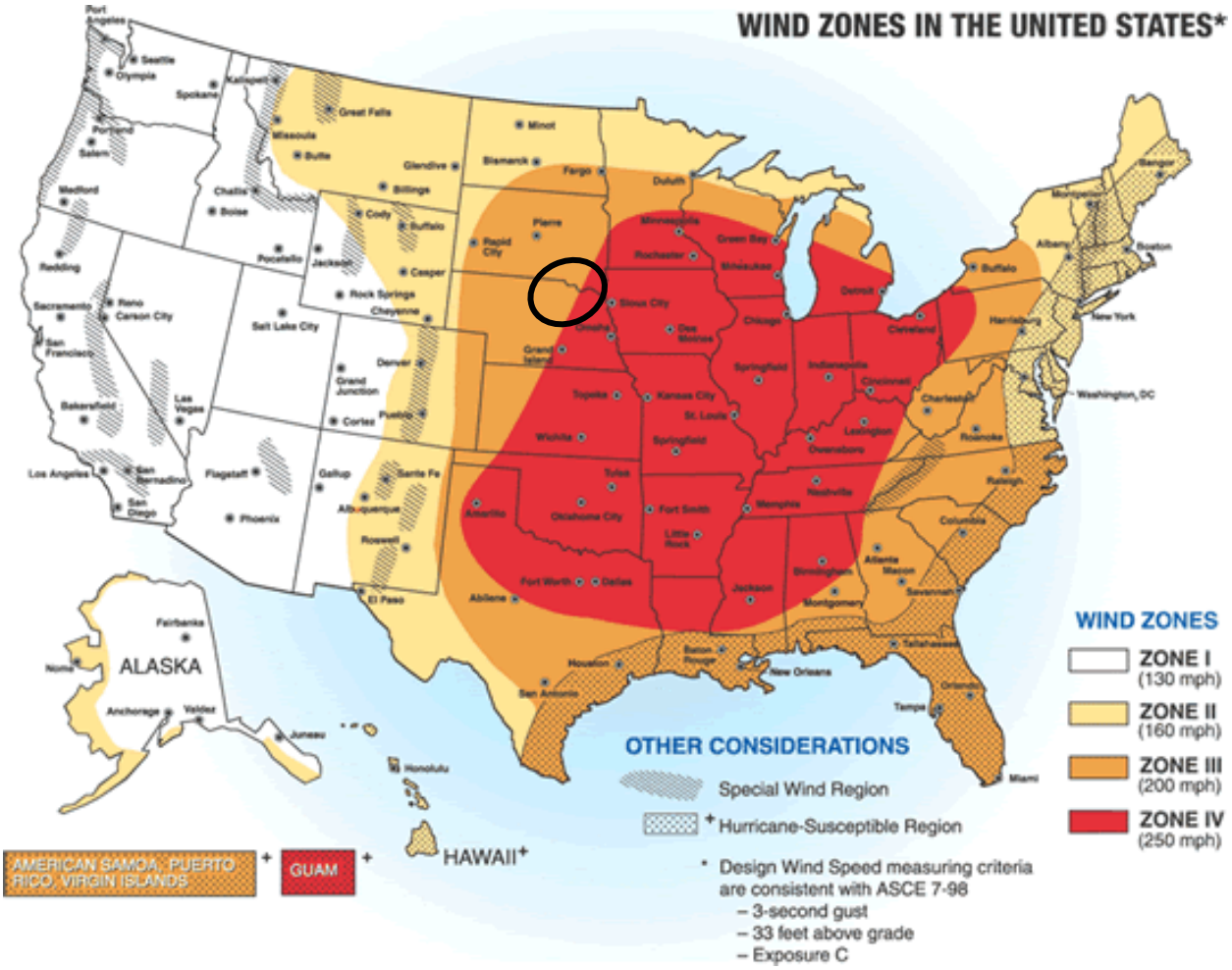
Figure 4-13 Beaufort Wind Scale

Beaufort Number	Wind Speed (miles/hour)	Wind Speed (km/hour)	Wind Speed (knots)	Description	Wind Effects on Land
0	< 1	< 1	< 1	Calm	Calm. Smoke rises vertically.
1	1-3	1-5	1-3	Light Air	Wind motion visible in smoke.
2	4-7	6-11	4-6	Light Breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	12-19	7-12	Gentle Breeze	Leaves and smaller twigs in constant motion.
4	13-18	20-28	11-16	Moderate Breeze	Dust and loose paper are raised. Small branches begin to move.
5	19-24	29-38	17-21	Fresh Breeze	Small trees begin to sway.
6	25-31	39-49	22-27	Strong Breeze	Large branches are in motion. Whistling is heard in overhead wires. Umbrella use is difficult.
7	32-38	50-61	28-33	Near Gale	Whole trees in motion. Some difficulty experienced walking into the wind.
8	39-46	62-74	34-40	Gale	Twigs and small branches break from trees. Cars veer on road.
9	47-54	75-88	41-47	Strong Gale	Larger branches break from trees. Light structural damage.
10	55-63	89-102	48-55	Storm	Trees broken and uprooted. Considerable structural damage.
11	64-72	103-117	56-63	Violent Storm	Widespread damage to structures and vegetation.
12	> 73	> 117	> 64	Hurricane	Considerable and widespread damage to structures and vegetation. Violence.

Source: National Weather Service

Figure 4-14 depicts wind zones for the United States. The map denotes that the Tribe falls into Zone I, which is characterized by high winds of up to 130 mph (above Beaufort Number 12).

Figure 4-14 Wind Zones in the United States



Source: FEMA

Tornadoes

Tornadoes and funnel clouds can also occur during severe storms. Tornadoes are another severe weather hazard that, though rare, can affect areas in the SSN, primarily during the rainy season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential across a path only 300 yards wide or less as 300-mile-wide hurricanes. Figure 4-15 illustrates the potential impact and damage from a tornado.

Figure 4-15 Potential Impact and Damage from a Tornado

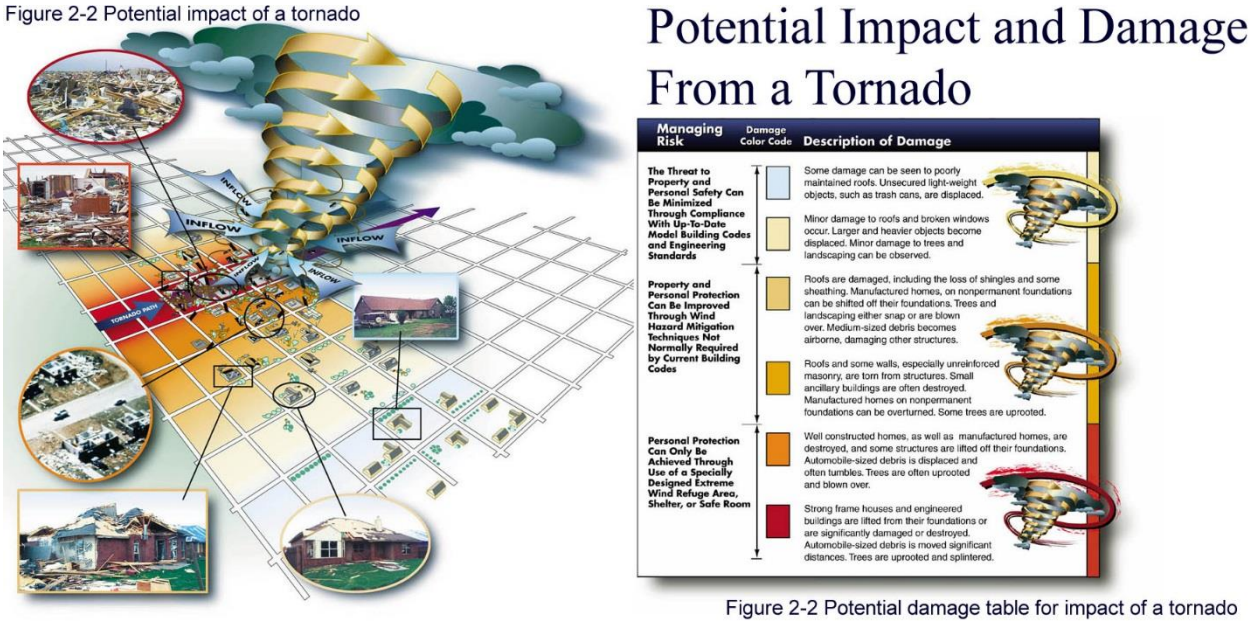


Figure 2-2 Potential damage table for impact of a tornado

Source: FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

Tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, and the outbreak of fires. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Location and Extent

Tornadoes, while rare, can occur at any location in the SSN. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. Table 4-18 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 4-19 shows the wind speeds associated with the Enhanced Fujita Scale ratings.

Table 4-18 Original Fujita Scale

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/f-scale.html

Table 4-19 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	Over 200

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/ef-scale.html

It is difficult to predict a tornado or the conditions that preclude a tornado far in advance. Tornadoes can strike quickly with very little warning. Most tornadoes that touch down are not long lived.

Past Occurrences

Disaster Declaration History

There have been no past federal or state disaster declarations due to high winds or tornadoes in Knox County, as detailed in Table 4-4.

NCDC Events

The NCDC data recorded 198 high wind and tornado incidents for Knox County since 1955. A summary of these events is shown on Figure 4-16 and in Table 4-20. Information on events that happened in or near the Santee Sioux Reservation are shown below the table.

Figure 4-16 Santee Sioux Nation – Tornado Touchdowns

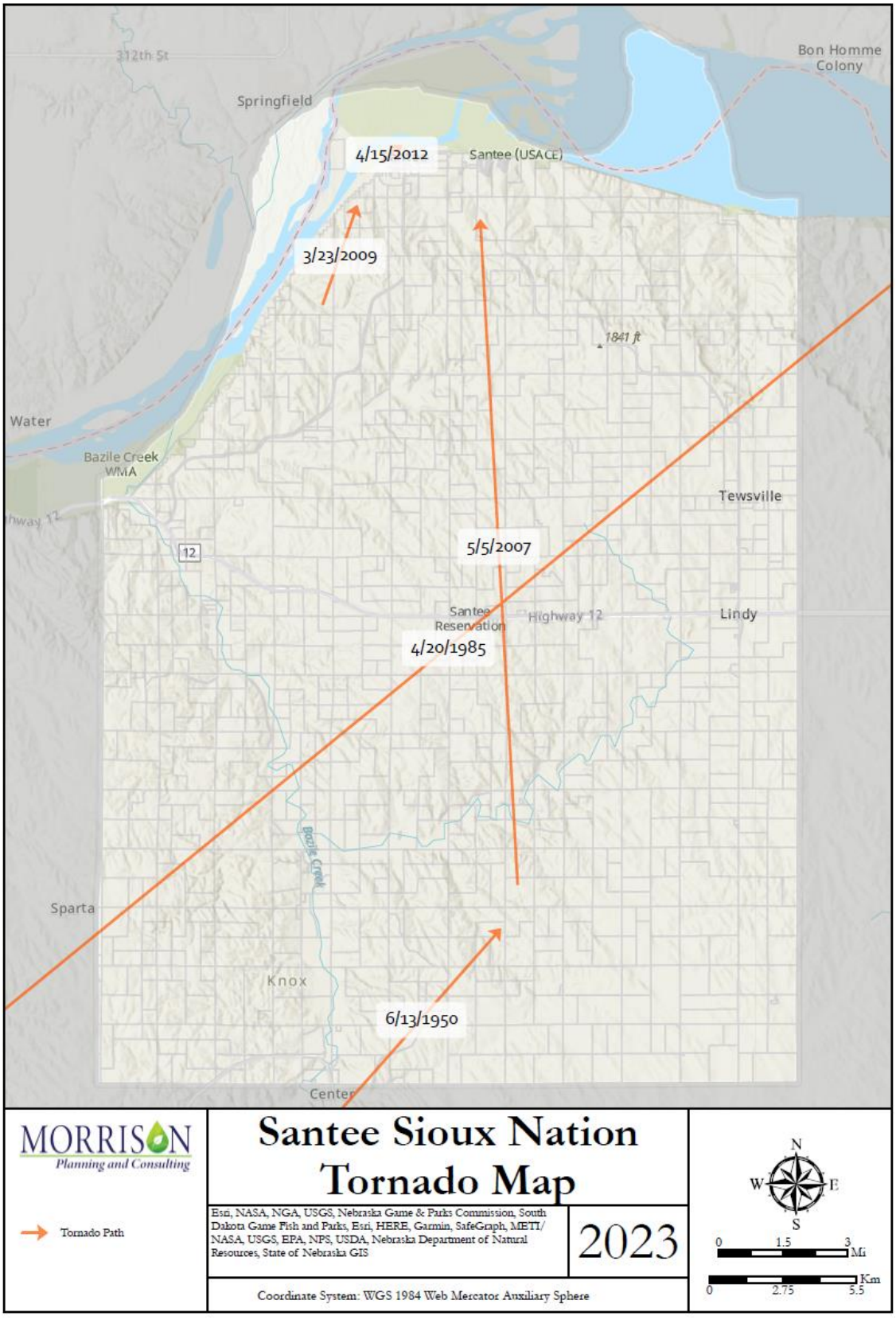


*Table 4-20 Knox County NCDC Wind and Tornado Events 1/1/1950-1/31/2023**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
High Wind	20	0	0	1	0	$53,000	$0
Thunderstorm Wind	132	0	0	0	0	$559,000	$0
Tornado	46	1	0	107	0	$5,732,560	$0
Total	**198**	**1**	**0**	**108**	**0**	**$6,344,560**	**$ 0**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of the SSN and outside of Knox County.

8/29/1997 – No event narrative.

6/24/1998 – a funnel cloud was reported. It did not touch down on SSN lands.

7/7/2001 – Thunderstorm wind gusts over 60 mph downed large tree limbs and broke a few windows on homes in Santee.

6/24/2003 – Law enforcement officials estimated thunderstorm wind gusts of 60 to 70 mph in Santee.

3/23/2009 –An intense upper-level low pressure system tracked from eastern Colorado into southeast South Dakota from March 23rd into March 24th. This caused a surface low pressure system to move from western Nebraska into southeast South Dakota during that time. As the low tracked northeast, a dry line moved into eastern Nebraska during the afternoon of March 23rd. With surface temperatures in the 60s and 70s, and dewpoint temperatures in the 50s, ample instability was in place to allow a line of severe thunderstorms to develop as the dry line punched eastward. Several fast moving low-topped supercell thunderstorms were embedded in the line, and one cell produced cyclic tornadoes from southeast of Lincoln into western Iowa. The storms in the line were moving north northeast at 50 to 60 mph. In addition to the severe weather, strong southerly gradient winds prevailed ahead of the low pressure. In some cases, the winds gusted between 50 and 65 mph for several hours across parts of eastern Nebraska. A tornado touched down on the Nebraska side of the Missouri River south of Springfield, SD. The tornado caused some tree damage in the area.

4/15/2012 – A brief rope tornado touchdown was observed just north of Santee. The deep low pressure that brought several tornadoes to southeast Nebraska on April 14th, tracked across northeast Nebraska during the morning and early afternoon of April 15th. Although a front had swept through the region, there was still enough instability around to allow for the development of low-topped mini super-cell thunderstorms that spawned a couple of brief weak tornadoes under the upper low.

8/7/2019 – An isolated supercell thunderstorm moved out of South Dakota and into Knox County during the late evening hours. Power lines and trees were blown down. Hail of unknown size was also reported.

Tribal Hazard Mitigation Planning Committee Events

Nebraska is ranked fifth in the nation for tornado frequency with an annual average of 57 tornadoes between 1991 and 2010.

The HMPC noted an event in July of 2023. Though the tornado did not touch down on SSN lands, it did touch down across river between Springfield, SD and Tabor, SD. This is a few miles from village of Santee. The Tribe noted that this will likely happen again. This is the second tornado seen across the Missouri River from the village of Santee in the past 5 years.

Probability of Future Occurrences

Highly Likely – Based on NCDC data and HMPC input, 198 wind and tornado incidents over a 68-year period (1955-2028) equates to a severe wind event every year. High winds are a well-documented seasonal occurrence that will continue to occur annually in the SSN.

Climate Change and High Winds and Tornadoes

According to the University of Nebraska, while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The University does not discuss non-thunderstorm winds or tornadoes.

Vulnerability Assessment

Vulnerability—Medium

The SSN is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. High winds and tornadoes can be a significant public safety and economic concern.

Vulnerability to and Impacts from High Winds and Tornadoes

The Tribe is subject to potentially destructive straight-line winds. High winds are common throughout the area and can happen during most times of the entire year. Straight line winds are primarily a public safety and economic concern. Tornadoes are rarer but can occur on the Reservation. Winds and tornadoes can affect urban trees, especially when they are already weakened from drought or disease. Impacts from straight line winds and tornadoes include:

- Injury to people from flying debris and downed trees
- Building and structure damages
- Hazardous and downed trees
- Increased streambank erosion during periods of high water and high winds
- Increase in wind-blown weeds
- Power line and other utility impacts and economic losses from power outages
- Increased wildfire risk

The North Central Public Power District (the power provider for the SSN) noted that there are multiple impacts to their facilities from high winds that can affect their ability to provide power to SSN residents. Electrical sub-transmission (34.5 kV to 69 kV) and distribution (12.47 kV) overhead designed lines are affected by high wind hazards, specifically overhead lines that are not using twisted pair conductor. Single pole structures are more vulnerable due to the clearances between conductors. Galloping conductors caused

by high winds will operate electrical protective devices causing outages. The conductor movement can also damage connection devices and any equipment installed on poles.

Future Development

Future development in the SSN will take windstorms into account. The Tribe will work with its BIA and HUD partners to build any new facilities to current building codes, which take winds into account during the design and construction process.

4.3.5. Severe Weather: Winter Storms

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Severe winter storms are an annual occurrence in Nebraska. Winter storms can bring extreme cold, freezing rain, heavy or drifting snow, and blizzards. Blizzards are particularly dangerous due to drifting snow and the potential for rapidly occurring whiteout conditions which greatly inhibit vehicular traffic. Generally, winter storms occur between eh months of November and March but may occur as early as October and as late as April.

Heavy snow is usually the most defining element of a winter storm. According to the 2021 State of Nebraska Mitigation Plan, blizzards are the most spectacular and vicious of all winter storms. They are characterized by strong winds bearing large amounts of snow. They have the capacity to completely immobilize large areas. Ground blizzards can also occur when snow that has already fallen gets picked up and blown around from heavy winds causing limited visibility. Blizzards occur most frequently in the northern Great Plains and upper Mississippi Valley. They can occur from the first of October to the end of April, but most often occur from early November to the end of March. According to the NWS, a blizzard occurs when the following conditions last for three hours or longer:

- Wind speeds of 35 miles per hour (mph) or more
- Considerable falling and/or blowing snow (reducing visibility frequently to less than 1/4 mile)
- Generally, temperatures of 20 degrees Fahrenheit (F) or lower

To be considered a severe blizzard, the system must have:

- Wind speeds of 45 mph or more
- A great density of falling and/or blowing snow (reducing visibility frequently to near zero)
- Temperatures of 10 degrees F or lower

Ice storms are a type of winter storm characterized by freezing rain which occurs when raindrops move into a thin layer of below-freezing air near the surface of the earth, allowing them to freeze on contact to the ground, trees, overhead utility lines, cars and other objects. The U.S. National Weather Service defines an ice storm as a storm which results in the accumulation of at least 0.25 inch of ice on exposed surfaces. Impacts from ice storms are most commonly vehicle accidents and damage to utility infrastructure. Ice accumulation can also collapse roofs on buildings.

The 2023 Tri-County (including Knox County) Hazard Mitigation Plan noted that along with snow and ice storm events, extreme cold is dangerous to the well-being of people and animals. What constitutes as extreme cold varies from region to region but is generally accepted as temperatures that are significantly lower than the average low temperature. In the SSN, the coldest months of the year are January, February, and December. The average low temperature for these months is all below freezing (average low for the three months in the planning area is 12.4°F). The average high temperatures for the months of January, February, and December are near 34.2°F.

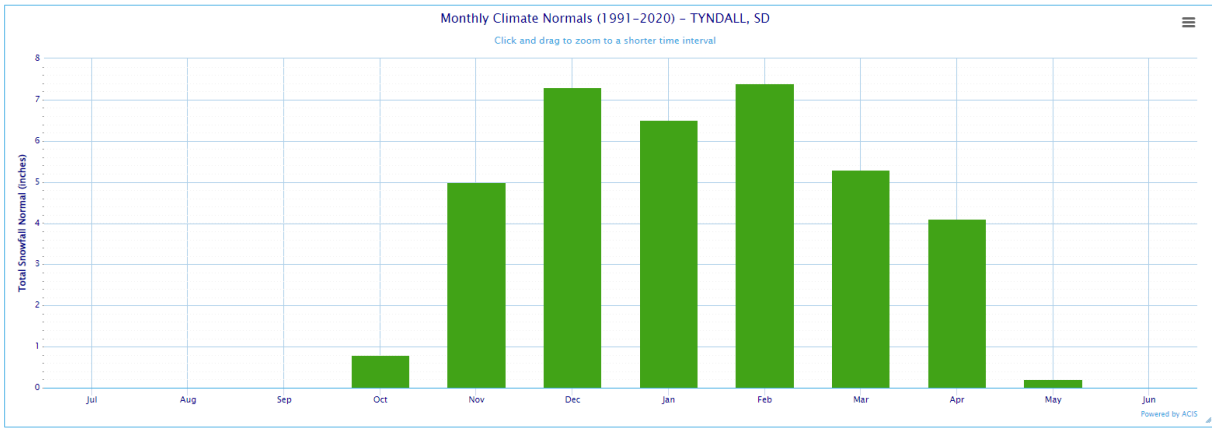
Location and Extent

The entire SSN is at risk to winter storms. Winter storms have a slow speed of onset and can traditionally be predicted days in advance. Duration can be long, from days to weeks. There is no scientific scale to measure winter storms. Snowfall tends to be used as the measure.

Tyndall, SD NWS Station

According to the NWS, average annual snowfall in and around the Tribe since 1991 averages 36.6 inches. Figure 4-17 shows the average snowfall by month for the Tribe.

Figure 4-17 Santee Sioux Nation – Monthly Snowfall Averages 1991-2020



Month	Total Snowfall Normal (inches)
July	0.0
August	0.0
September	0.0
October	0.8
November	5.0
December	7.3
January	6.5
February	7.4
March	5.3
April	4.1
May	0.2
June	0.0
Annual	36.6

Source: National Weather Service XMAC site. Retrieved 7/14/2023.

Past Occurrences

Disaster Declaration History

There has been one past federal declaration for winter weather, as shown on Table 4-21.

Table 4-21 Knox County Winter Weather Disaster Declarations 1950-2023

Disaster Type	Federal Declarations	
	Count	Years
Snowstorm	1	2018

Source: FEMA

NCDC Events

The NCDC reports 142 events of past extreme cold and freeze for Knox County since 1996 as shown on Table 4-22. Information on events that occurred near or on SSN lands are included below the table.

Table 4-22 NCDC Winter Storm and Freeze Events for Knox County 1996-1/31/2023*

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	16	0	0	0	0	$0	$0
Cold/Wind Chill	45	0	0	0	0	$0	$0
Extreme Cold/Wind Chill	9	0	0	0	0	$0	$0
Heavy Snow	13	0	0	0	0	$0	$0
Ice Storm	3	0	0	0	0	$0	$0
Winter Storm	49	0	0	0	0	$3,500,000	$0
Winter Weather	7	0	0	0	0	$0	$0
Total	**142**	**0**	**0**	**0**	**0**	**$3,500,000**	**$ 0**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Knox County

11/20/2015 –An intense band of heavy snow developed over Knox County early on Friday November 20th. The heavy snow was occasional in nature during the morning, but became steady during the early afternoon, ending by early evening. Total snowfall across the county ranged from 6 to as much as 16 inches. This included a measured 6.2 inches in Verdel, 10.7 inches in Bloomfield, and 16 inches in Santee.

Tribal Hazard Mitigation Planning Committee Events

The SSN noted that winter storms occur every year. Past events where damages occurred include:

2007 – severe winter storms caused damage to power lines and other areas. The SSN and Knox County were granted a federal disaster declaration (DR-1674). A distribution line was damaged, causing power outages in the SSN. The distribution line was fixed, but damages of just under $1 million occurred.

2018 – Spring storms in April of 2018 caused damage to the SSN and greater Knox County, resulting in a federal disaster declaration (DR-4375). Damage to power lines of $20k was reported.

Climate Change and Severe Winter Storms

With Nebraska and the SSN's climate location, winter storms are highly likely each winter with varying degrees of severity. Historical data indicates that several severe storms will impact the state each season with storms covering areas from a few counties to the entire state.

Projected changes in the climate should be considered in relation to the probability of future events. The 2021 State of Nebraska Hazard Mitigation Plan noted that Nebraska has experienced general warming of about 1 degree since 1895, with the majority of this warming occurring during the winter months. Minimum temperatures are rising 2.0-4.0°F per century and maximum temperatures increase 1.0-2.5° F per century. Although, trends for winter storms show an increase in frequency and intensity since 1950 as well as a poleward shift in the storm tracks, it is anticipated that the extent of snow cover will decrease in future years in part because of warmer temperatures causing earlier melt and increasing amounts of precipitation that falls as rain rather than snow. In addition, snowfall amounts show regional variability, with general increases in the northern Great Plains and Great Lakes regions. The UNL report further addresses future impacts from winter events:

> ***Snow cover extent changes in direct response to projected increased temperatures and in response to more variable changes in precipitation. Temperature changes reduce the amount of time that snow remains on the ground and affect the fraction of precipitation that falls as snow rather than rain. Given the consistency among model studies, scientists conclude that it is virtually certain that Northern Hemisphere snow cover extent will decrease in the future.***
>
> ***A major concern for Nebraska and other central Great Plains states is the current and continued large projected reduction in snowpack for the central and northern Rocky Mountains. This is due to both a reduction in overall precipitation (rain and snow) and warmer conditions, meaning more rain and less snow, even in winter. Flows in the Platte and Missouri rivers during the summer months critically depend on the slow release of water as the snowpack melts."***

In conclusion, with the meteorological trend of the weather becoming warmer due to global warming, and climate change projections that indicate less snow in the winter, there is a slightly lower potential for large/record amounts of snowfall. Essentially this makes future winter storm events highly likely, but with the potential for decreased impacts.

Vulnerability Assessment

Vulnerability—Medium

Vulnerability to and Impacts from Winter Storms

Blizzards can cause impacts to the SSN. Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to winter storms include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals who work outside
- Individuals dependent on medical equipment
- Individuals with impaired mobility

Of significant concern is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold and freeze. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold.

Impacts to the SSN as a result of winter snowstorms include damage to infrastructure, utility outages, road closures, traffic accidents, and interruption in business and school activities. Strong winds combined with intense snowstorms can knock down trees, utility poles and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings, significantly increasing the likeliness of serious vehicle accidents. Black ice presents a deadly driving hazard when ice on surfaces cannot be seen. Ice jams can occur when bodies of water have long periods of frozen spells which cause a rise in the water level or a thaw breaks the ice into large chunks which become jammed at manmade and natural obstructions in the waterway. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures and ice can cause accidents and road closures and can cause significant damage to the agricultural industry. Also of concern as described above is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. Delays in emergency response services can be of significant concern. Further, there are economic impacts associated with areas prone to heavy snow. Extreme cold can affect agricultural products and cattle in the SSN and the County.

The North Central Public Power District (the power provider for the SSN) noted that there are multiple impacts to their facilities from winter storms that can affect their ability to provide power to SSN residents. They noted that winter storms can be catastrophic to the District, causing 30% or more damage. The intensity of these storms and the location determine the effect on the District's facilities. Overhead electric sub-transmission (69 kV & 34.5 kV) and distribution lines (12.47kV) with wood structures are more likely to be damaged than any other critical infrastructure. The likelihood increases if the conductor is not of the twisted pair variety. Damage to higher voltage lines (69 kV & 34.5 kV) are generally costlier, affect more consumers, and require longer outage times to repair than that of distribution voltages. All consumers are

fed via the sub-transmission lines, whereas distribution lines feed local areas only. Accumulated snow and especially ice on power lines, electrical facilities and trees in close proximity can cause power lines to be damaged, interrupting electricity to a large contingent of the power District's service area population. Transportation is also affected by these types of storms, limiting the travel of emergency responders and electrical maintenance crews.

Future Development

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the County shifts resulting in a larger number of senior citizens in the Planning Area. Many of the residents of Plumas County are self-sufficient and accustomed to rural living.

4.3.6. Dam Failure

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States. Dam failures can also result from any one or a combination of the following causes:

- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

In general, there are three types of dams: concrete arch or hydraulic fill, earth and rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously; the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

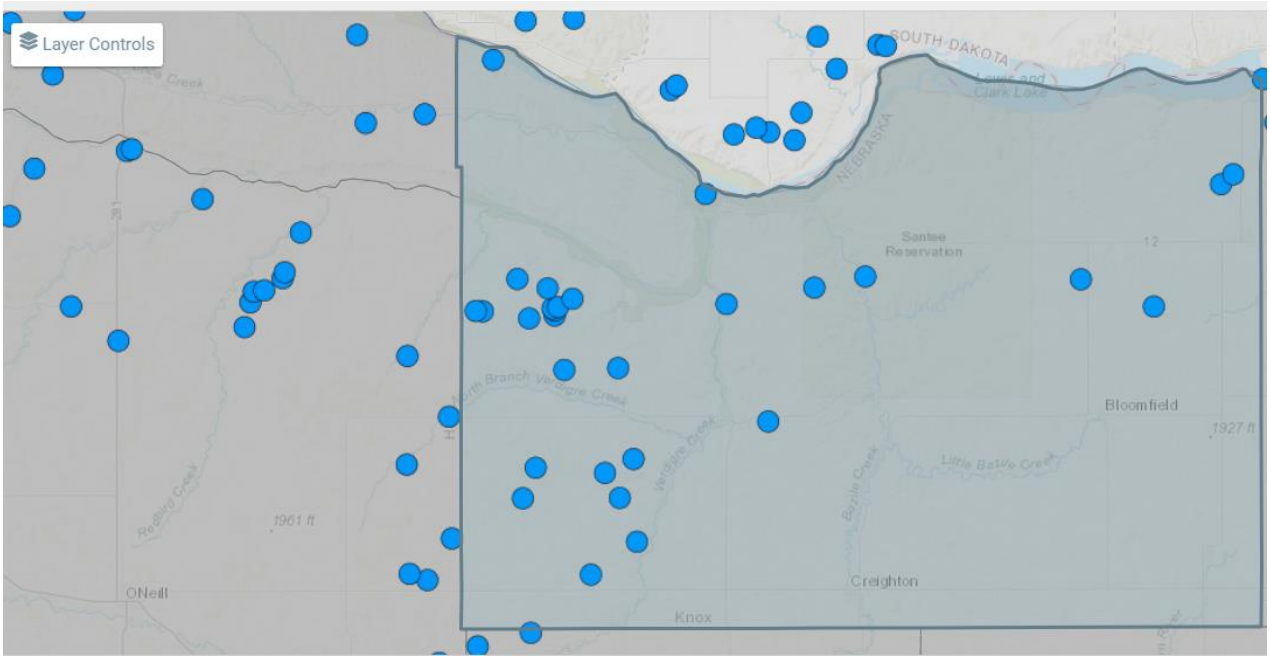
The 2005 Nebraska Safety of Dams and Reservoirs act gives the Nebraska Department of Natural Resources (NeDNR) the authority to conduct routine inspection of dams, review the design and construction of dams, and require dam owners to develop emergency action plans for their dam. The NeDNR classifies dams by the potential hazard each poses to human life and economic loss as well as regulates dam safety. The following table is classifications and descriptions for each hazard class:

- **High Hazard** – failure of the dam expected to result in loss of human life is probable. Failure may cause serious damage to homes, industrial or commercial buildings, four-lane highways, or major railroads. Failure may cause shallow flooding of hospitals, nursing homes, or schools.
- **Significant Hazard** – failure of the dam expected to result in no probable loss of human life but could result in major economic loss, environmental damage, or disruption of lifeline facilities. Failure may result in shallow flooding of homes and commercial buildings or damage to main highways, minor railroads, or important public utilities.
- **Low Hazard** – failure of the dam expected to result in no probable loss of human life and in low economic loss. Failure may damage storage buildings, agricultural land, and county roads.
- **Minimal Hazard** – Failure of the dam expected to result in no economic loss beyond the cost of the structure itself and losses principally limited to the owner's property.

Location and Extent

According to data provided by National Inventory of Dams, there are multiple dams in the nearby area constructed for flood control, storage, electrical generation, and recreational purposes. Figure 4-18 focuses not on the SSN area alone, but zooms out to the larger area. Table 4-23 identifies the 6 dams of concern to the Tribe. It should be noted that the Tribe owns none of the dams of concern. It should also be noted that the Spencer Dam failed in 2019 and has not been rebuilt, nor is it likely to be rebuilt.

Figure 4-18 Santee Sioux Nation – Area Dam Inventory



Source: National Inventory of Dams

Table 4-23 Santee Sioux Nation Dams of Concern

Dam Name	Dam Type	Year Built	Dam Height feet	Dam Length feet	Capacity acre feet*	Hazard Classification
Vakoc Dam	Earth	1974	19	575	55	Low
Barta Family Pond Dam	Earth	1990	33	340	23	Low
Woodworth Dam	Earthfill	1990	32	338	69	Low
Paesl Dam	Earthfill	1958	25	420	90	Significant
Spencer Dam**	Earth	1978	29	3,720	16,500	Significant
Fort Randall Dam	Rolled Earth fill	1953	165	10,700	3800,000	High

Source: NID, National Performance of Dams Program

*One acre foot equals 325,000 gallons

**Failed in 2019 and not likely to be rebuilt. Included in the table as it was shown on the map.

Past Occurrences

Disaster Declaration History

There have been no disasters declarations related to dam failure in Knox County, as shown in Table 4-4. It was noted that a dam did overtop during the 2019 event, but it was not the direct source of the disaster declaration for the County.

NCDC Events

There have been no NCDC dam failure events in Knox County.

National Performance of Dams Program Events

The National Performance of Dams Program at Stanford University tracks dam failures. A search of the National Performance of Dams Program database showed no past dam failure events on dams that could affect the Tribe.

Tribal Hazard Mitigation Planning Committee Events

Spring 2019 - When rain began to fall on melting snow in early March, water that rushed into the frozen Niobrara River broke up ice that was up to two feet thick and sent it downstream. The pressure of the increased flows and ice proved more than Spencer Dam, built in 1927, could handle. When the dam breached on March 14, it unleashed a 10-to-15-foot wall of ice and water. Below the dam, the Straw Bale Saloon and a campground were erased, and the saloon's owner was killed. Spencer Dam WMA, an area managed by Game and Parks and popular among catfish anglers, was scoured by flows, and the Highway 281 bridge washed out. As it continued to the Missouri River, the ice and water wiped out more bridges, businesses, homes and farms. South of Verdel, a river gauge measured flows at 123,000 cubic feet per second where flows are normally 2,000 cfs. One of those bridges was located about 35 miles downriver on Highway 12 at Niobrara, where the river crested nearly 7 feet above previous record. Videos posted on social media of the 450-foot span of concrete and steel floating away on a river of ice illustrated the power of the flooding that was already happening (see Figure 4-19), or soon would be, across eastern Nebraska.

Figure 4-19 Historic Bridge Damaged by 2019 Flood and Dam Failure Event

Source: Outdoor Nebraska(https://magazine.outdoornebraska.gov/2020/02/2019-flood/).

Slabs of ice remained on the trail at Niobrara State Park five days after flooding washed out a section of the historic railroad bridge across the Niobrara River that linked the park to the village of Niobrara on March 14. A mile downriver, a historic steel railroad bridge that now served as a link on a popular trail running from Niobrara State Park to the village of Niobrara was swept away, as were other bridges and sections of trail. Due to repeated damage caused by flooding and the high cost, it is doubtful that the trail will be repaired.

With the highway closed, a commute between the park and town that took minutes now took hours, and the park struggled to find staff during the busy summer season. Damage to Highway 12 west of the park wasn't repaired until May. With access difficult, fewer people visited the park and the village, and both lost business. When a temporary bridge was completed and the highway reopened in August, the town threw a party. More information and pictures of damages can be found in the Past Occurrence in the Flood: 1%/0.2% Annual Chance discussion in Section 4.3.8.

Probability of Future Occurrences

Unlikely– There has been one recorded event of direct damages from dam failure. Based on past occurrences and the rigorous monitoring and inspection requirements for dams, the chance a dam failure may occur in the future that would impact the Tribe is unlikely. The THMPC noted that it could be considered to be occasional based on aging dam systems and variety of dam owners, some with limited resources to properly maintain dams.

Climate Change and Dam Failure

Increases in precipitation in areas upstream of dams could increase the potential for dam failure and uncontrolled releases on the dam that could affect the Tribe.

Vulnerability Assessment

Vulnerability—Low

Dam failure flooding can occur as the result of a partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is generally confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions. Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding.

Vulnerability to and Impacts from Dam Failure

A major dam failure and associated flooding could have a devastating impact on the SSN. Dam failure flooding presents a threat to life and property, including structures, their contents, and their use. Large flood events can affect natural resources as well as lifeline critical utilities (e.g., water, sewerage, and power), transportation, the environment, and the local and regional economies.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, homes, and Tribal facilities. Electric generating facilities and transmission lines could also be damaged and affect communities outside the immediate hazard area. Associated water supply, water quality and health concerns could also be an issue. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

Dam failures and their impacts vary by location and severity of any resulting flood event. Based on the risk assessment, it is evident that a dam failure flood could have potentially devastating economic impacts to certain areas of the SSN. Impacts that are not always quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Significant disruption to students and teachers as temporary facilities and relocations may be needed.
- Impact on the overall mental health of the community.

Future Development

Although new growth and development corridors may fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur. In the near term, the areas of future development slated fall outside of any dam inundation areas.

4.3.7. Drought and Water Shortage

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Drought

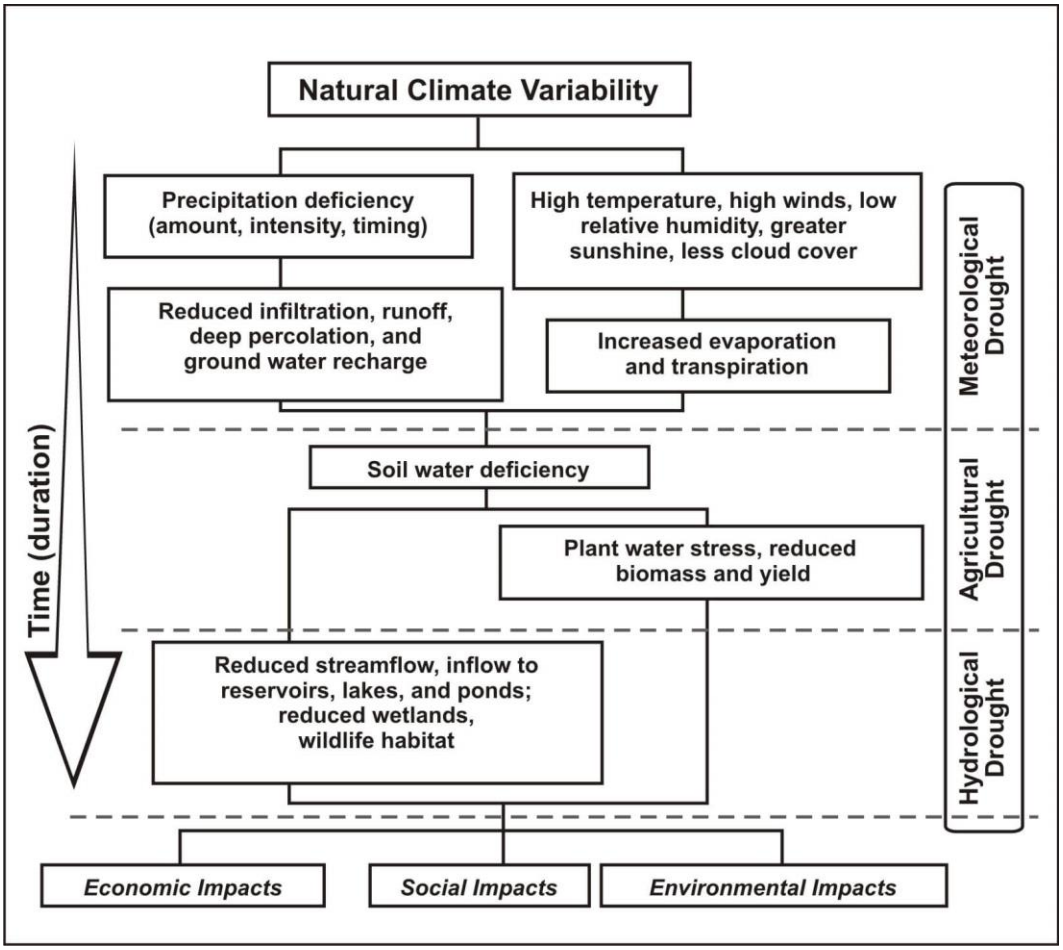
Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively

rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving (see Figure 4-20) many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological drought** is usually defined by a period of below average water supply.
- **Agricultural drought** occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological drought** is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic drought** occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

Figure 4-20 Causes and Impact of Drought



Source: National Drought Mitigation Center (NDMC)

Location and Extent of Drought

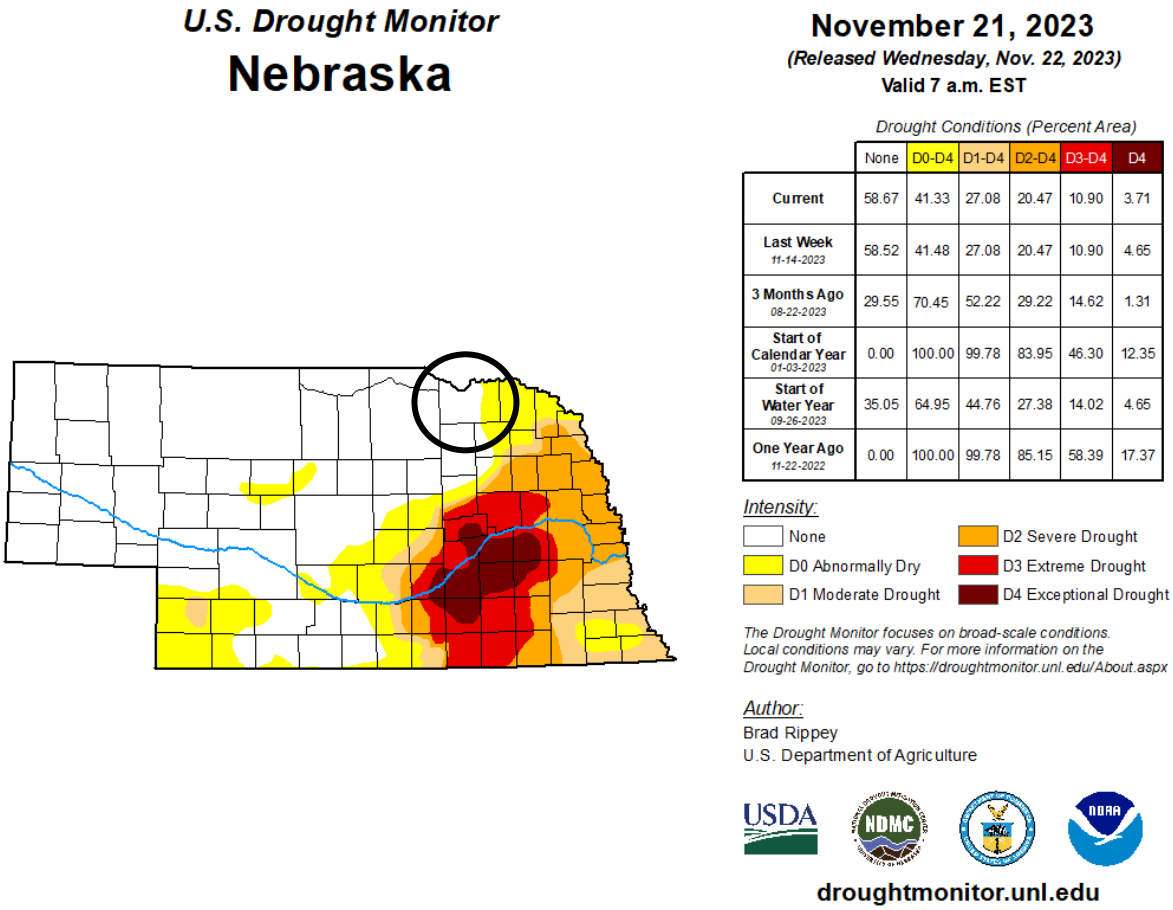
Drought is a regional phenomenon that affects the entire SSN, surrounding Knox County, and the State of Nebraska. Drought has a slow onset and long duration. Drought is not initially recognized as a problem because it normally originates in what is considered good weather, which typically includes a dry late spring and summer.

Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The Drought Monitor includes a scale to measure drought intensity:

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

A snapshot of the current drought conditions in Nebraska and the SSN can be found in Figure 4-21. The Tribe and surrounding areas are currently in a moderate to severe drought, as defined by the US Drought Monitor.

Figure 4-21 Current Drought Status in the Santee Sioux Nation and Nebraska



Source: US Drought Monitor

Water Shortage

SSN's water resources have historically been affected by periodic drought cycles. Multi-year droughts in particular can diminish the supply of water available to the Tribe and its residents. However, when precipitation levels are up, these water sources can and do rebound. While the SSN sits adjacent to the Missouri River, its water source comes from groundwater wells. As owner and operator of the Tribe's System, the Santee Sioux Tribe of Nebraska is responsible for the daily operation and maintenance of the water treatment plant, conducting monitoring, providing public notice and delivering drinking water to its customers that complies with the National Primary Drinking Water Regulations. There have been past reports of these groundwater wells seeing higher levels of manganese.

Manganese in Groundwater

Manganese is a naturally occurring element that has been found in many surface and ground water sources and in soils that may erode into these waters. At low levels, manganese is an essential part of the human diet. However, infants who drink water, including water in infant formula, containing more than 0.3 mg/L of manganese over a period of 10 days may have negative neurological effects. The EPA has recommended

that when exceedances of health advisory levels of unregulated contaminants are identified in drinking water that states and tribes consider additional actions, such as taking additional sampling, notifying the public and, if necessary, conducting mitigation.

Location and Extent of Water Shortage

Since water shortage generally happens on a regional scale, the entirety of the SSN is at risk. There is no established scientific scale to measure water shortage. The speed of onset of water shortage tends to be lengthy. The duration of water shortage can vary, depending on the severity of the drought that accompanies it and the status of the water sources going into the drought. The extent of the drought considers several factors, including the nature, source, and reliability of water.

Past Occurrences

Disaster Declaration History

There have been no federal disaster declarations for drought for Knox County. This was shown on Table 4-4.

NCDC Events

There have been 13 NCDC drought events in Knox County and the SSN since 1996. Table 4-10 summarizes these events.

*Table 4-24 Knox County NCDC Drought Events 1996-1/31/2023**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Drought	13	0	0	0	0	$0	$0
Total	**13**	**0**	**0**	**0**	**0**	**$ 0**	**$ 0**

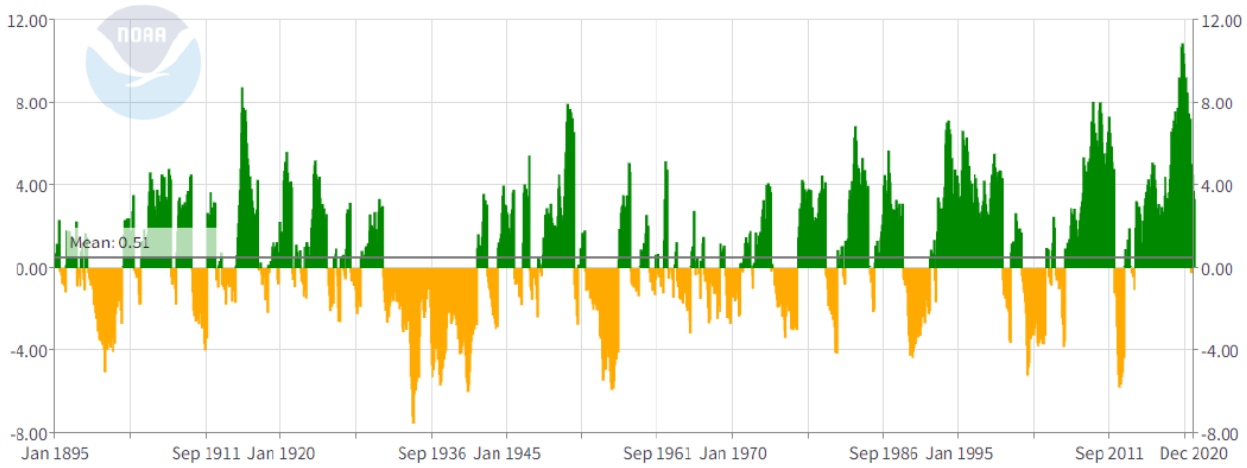
Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of the Tribe and outside of Knox County.

Palmer Drought Severity Index Events

The Palmer Drought Severity Index (PDSI) is utilized by climatologists to standardize global long-term drought analysis. The data for the SSN is part of Nebraska Climate Division 3. Historical drought information for Climate Division 3 can be seen on Figure 4-22. Areas in yellow indicate times of drought.

Figure 4-22 Santee Sioux Nation – Palmer Drought Severity Index 1895-2020



Source: National Drought Mitigation Center

Tribal Hazard Mitigation Planning Committee Events

The THMPC noted that drought has been an ongoing issue for the Tribe. The THMPC also noted that water shortage has been an issue for the Tribe. There have been recent issues with manganese in the Tribe's drinking water. The Tribe provided an initial Public Notice to its consumers on May 12, 2020, following the April sample results of their groundwater wells for manganese levels that were greater than 1 mg/L. This public notice recommended that all consumers not consume the drinking water for consumption or cooking purposes. Following the change in operations to utilize the North Well only, a follow-up sample was collected on June 4, 2020. The sample results revealed that the manganese levels were below 1 mg/L, but remained above 0.3 mg/L. Therefore, the Tribe issued a revised Public Notice to notify residents and consumers that infants aged 6 months or less should use an alternate water source for drinking water and for formula bottle feeding. The revised Public Notice was issued by the Tribe on June 29, 2020, and currently remains in effect.

Probability of Future Occurrence

Drought

Likely—Historical drought data for the SSN and region indicate there have been multiple significant droughts since 1895 (as shown on Figure 4-22). Based on this data and given the multi-year length of droughts and future climate change affects, the Tribe determined that future drought occurrence continues to be likely.

Water Shortage

Occasional — Recent historical data for water shortage indicates that the SSN may at some time be at risk to both short and prolonged periods of water shortage, especially if the manganese issue is not worked out. Based on this it is possible that water shortages will affect the SSN in the future during extreme drought conditions. New development, landscaping, and road paving put stress on water resources. The supply of water is currently sufficient (though not of high quality), but as population grows and land use patterns shift, it will be necessary to consider the added stress that new development will put on water demand and

quality. This helps to keep the water shortage future occurrences to occasional, even though drought is considered likely.

Climate Change and Drought and Water Shortage

The 2021 State of Nebraska Hazard Mitigation Plan noted that model projections of changes in precipitation have less confidence than temperature. Precipitation can be highly variable from place to place and is generally more difficult to predict than temperature. Nebraska is situated around the dividing line in the North American continent between wetter conditions that are predicted for the north and east, and drier conditions that are predicted for the south and west. There is thought to be seasonal variability in this dividing line, with a general drying in summer and wetter conditions in winter. The summer drying trend is compounded by increased evaporation rates due to projected warming. River systems having source areas in the Rocky Mountains may experience changes in flow rates due to declining snowpack.

The NOAA State Summary (2019) provides an additional description of the impacts of climate change in future years:

> ***Although projections of overall precipitation are uncertain, and droughts are a natural part of the climate system, higher temperatures will increase evaporation rates and decrease soil moisture, leading to more intense future droughts. This would have negative impacts on dryland farming, although the impacts could be mitigated where irrigation is possible.***

Vulnerability Assessment

Vulnerability—Medium

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Vulnerability to and Impacts from Drought and Water Shortage

Based on historical information, the occurrence of drought in Nebraska, including the Tribe, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users.

Drought has the potential to affect the entire SSN and Knox County. The vulnerability of SSN to drought is Tribe-wide, but impacts may vary and include reduction in water supply, agricultural losses, impacts to natural resources, and an increase in dry fuels and tree dieback. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in the SSN are those related to water intensive activities such as municipal usage, commerce, tourism, recreation, and wildfire protection. The most direct and likely most difficult drought impact to quantify is

to local economies. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding and erosion.

Drought Impact Reporter

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The Drought Impact Reporter from the NDMC is a useful reference tool that compiles reported drought impacts nationwide. Table 4-25 show drought impacts for Tribe and Knox County from 1850 to June 2023. The data represented is skewed, with the majority of these impacts from records within the past 20 years.

Table 4-25 Knox County Drought Impacts 1850-6/30/2023

Category	Number of Impacts
Agriculture	12
Business and Industry	2
Energy	2
Fire	3
Plants & Wildlife	2
Relief, Response, and Restrictions	18
Society and Public Health	1
Tourism and Recreation	1
Water Supply and Quality	16
Total	**57**

Source: National Drought Mitigation Center, retrieved 7/13/2023

Future Development

The SSN has access to quantities of water through its water sources. However, additional growth in the SSN will add additional pressure to wells during periods of drought and water shortage. The Tribe will need to continue to plan for and manage their water resources to support the future of the SSN. The Tribe continues to make efforts to be proactive on future drought issues.

4.3.8. Flood: (1% and 0.2% Annual Chance)

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities and can cause life safety issues. Floods can be extremely dangerous. Six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. Floods kill more people trapped in vehicles than anywhere else.

During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

There are three primary types of freshwater flood events in the SSN: riverine (and ice jam), flash flooding, and urban stormwater. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reaches.

- **Riverine flooding** is the most common type of flood event and occurs when a watercourse exceeds its "bank-full" capacity. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. The duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. The warning time associated with slow rise floods assists in life and property protection.
  - ✓ A type of riverine flooding that affects the SSN is **ice jam flooding**. Ice jams occur when ice breaks up in moving waterways, and then stacks on itself where channels narrow or human-made obstructions constrict the channel. This creates an ice dam, often causing flooding within minutes of the dam formation. Ice formation in streams occurs during periods of cold weather when finely divided colloidal particles called "frazil ice" form. These particles combine to form what is commonly known as "sheet ice." This type of ice covers the entire river. The thickness of this ice sheet depends upon the degree and duration of cold weather in the area. This ice sheet can freeze to the bottom of the channel in places. During spring thaw, rivers frequently become clogged with this winter accumulation of ice. Because of relatively low stream banks and channels blocked with ice, rivers overtop existing banks and flow overland. This type of flooding tends to more frequently occur on wide, shallow rivers such as the Platte, although other rivers can be impacted.
- The term "**flash flood**" describes localized floods of great volume and short duration. In contrast to riverine flooding, this type of flood usually results from heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within a very short period of time.

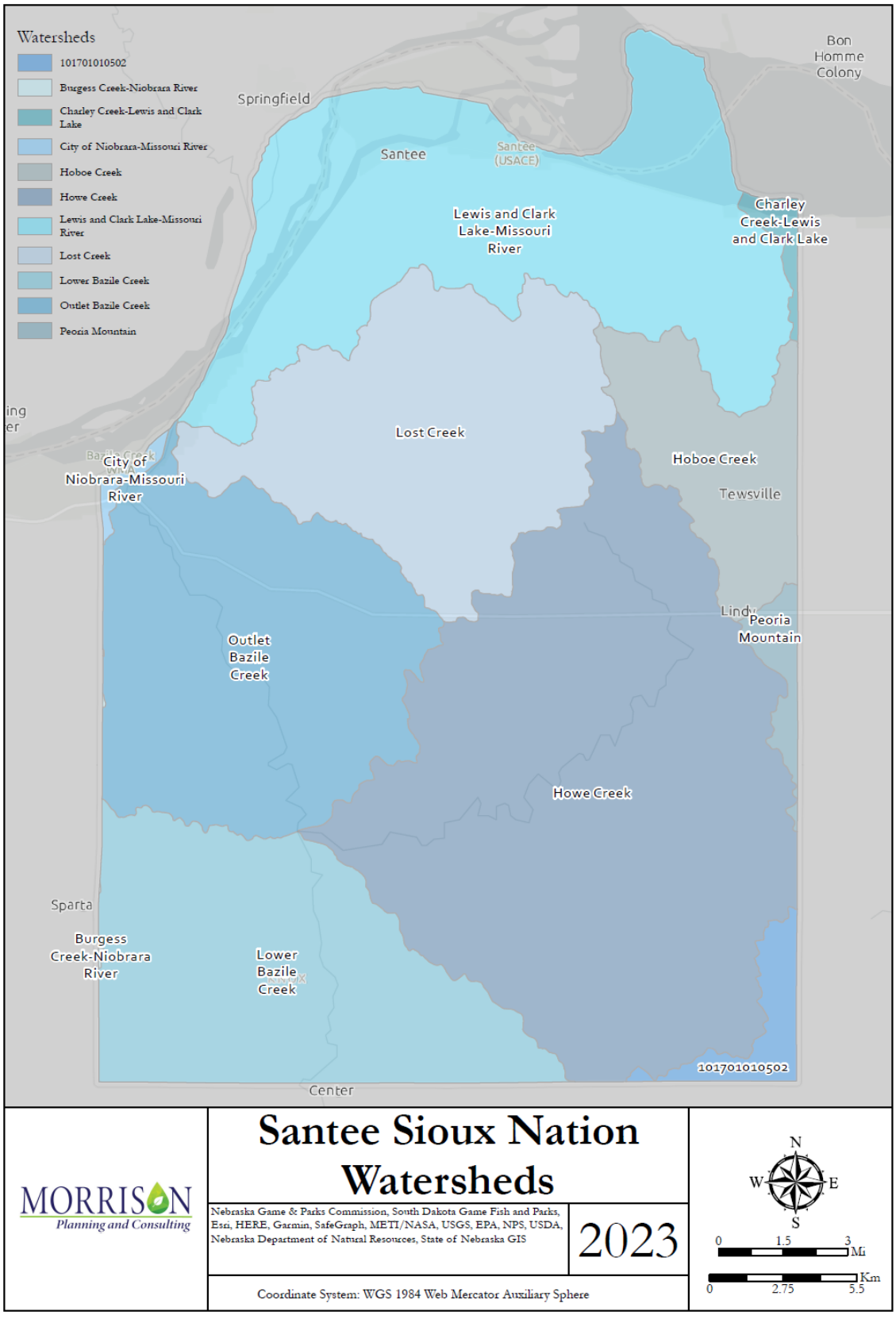
- **Stormwater/Urban** flood events have increased as land has been converted from fields or woodlands to roads and parking lots and lost its ability to absorb rainfall. Urbanization increases runoff by two to six times that of natural terrain.

The SSN is also at risk to flooding resulting from dam failures. Dam failure flooding is discussed separately in Section 4.3.5 of this document. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reach. The potential for flooding can change and increase through various land use changes and changes to land surface, resulting in a change to the floodplain. Environmental changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Location and Extent

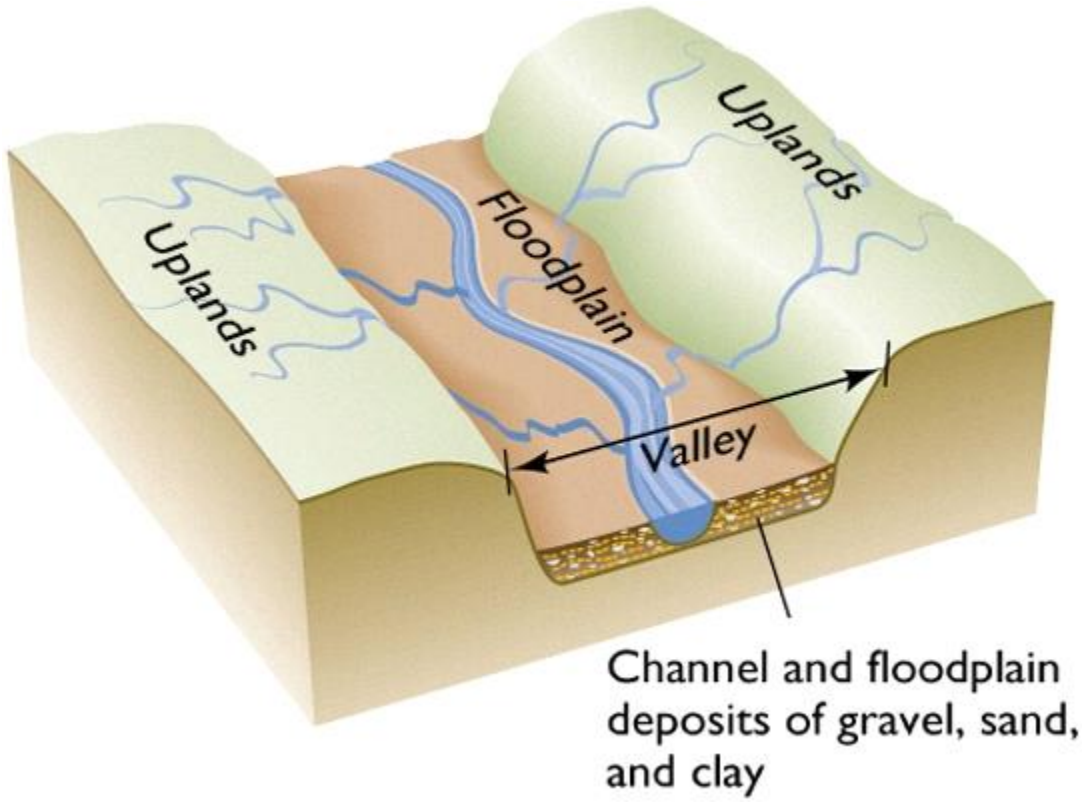
When water enters the watershed too quickly for the land to absorb it, flooding can occur. Floods can result from rapid melting of winter snows, severe thunderstorms, tropical storms, and other precipitation events. A map of watersheds in the SSN is shown on Figure 4-23.

Figure 4-23 Santee Sioux Nation – Watersheds



The area adjacent to a channel is the floodplain (see Figure 4-24). Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 100-year flood, the flood that has a one percent chance in any given year of being equaled or exceeded (1% annual chance flood). The 1% annual chance flood is the national standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP). The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year (0.2% annual chance flood). The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Figure 4-24 Floodplain Schematic



Source: FEMA

Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the NFIP. The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study.

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of the community that will be used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The SSN is covered by the Knox County FIS (dated 10/2/2015).

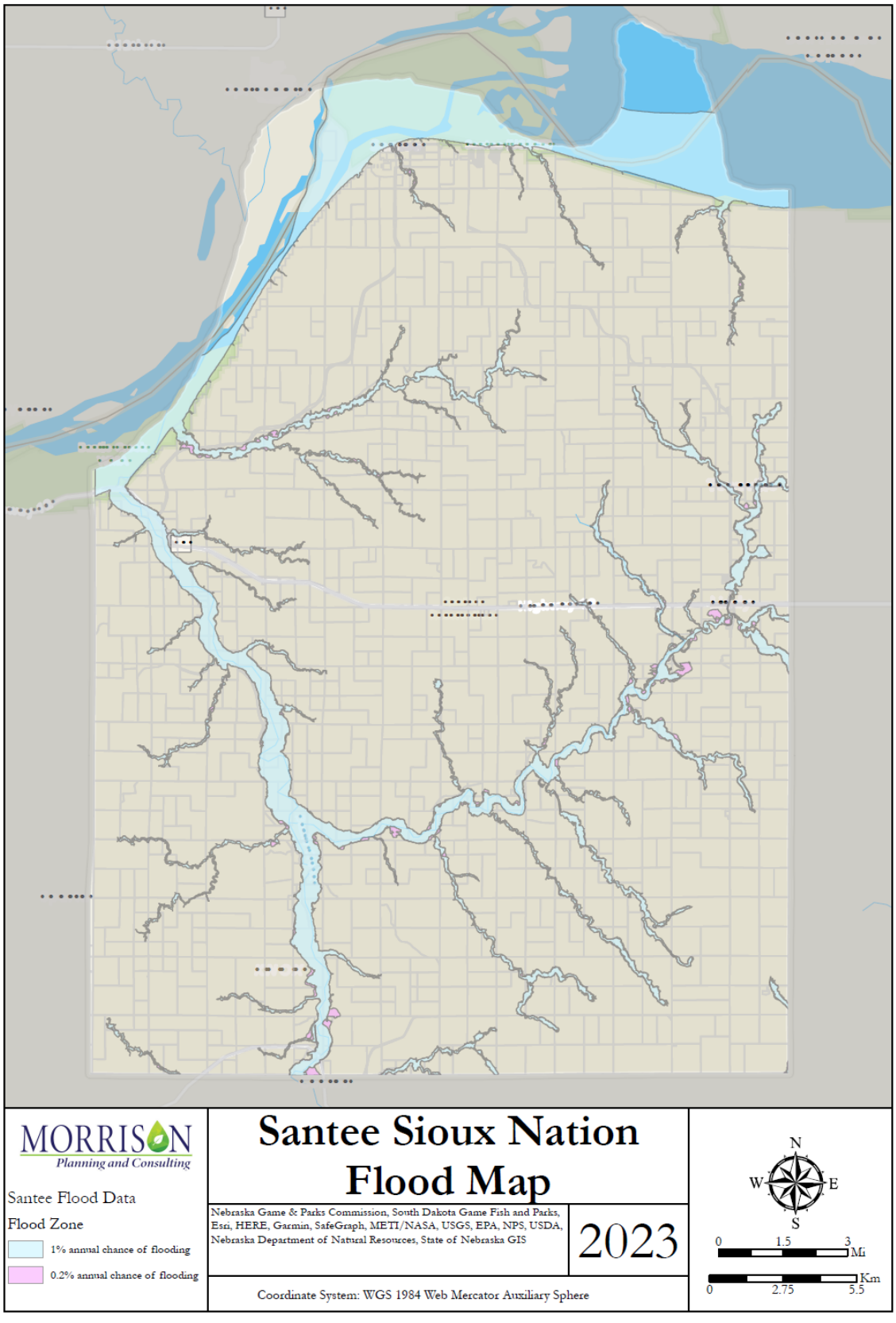
Digital Flood Insurance Rate Maps (DFIRM)

As part of its Map Modernization program, FEMA has been converting paper FIRMS to digital FIRMs (DFIRMs). These digital maps:

- Incorporate the latest updates (Letters of Map Revision (LOMRs) and Letters of Map Amendment (LOMAs)
- Utilize community supplied data
- Verify the currency of the floodplains and refit them to community supplied basemaps
- Upgrade the FIRMs to a GIS database format to set the stage for future updates and to enable support for GIS analyses and other digital applications
- Solicit community participation

DFIRMs for Knox County have been developed and are being used for the flood analysis for this THMP. The SSN is covered by the Knox County DFIRM (dated 10/2/2015). FEMA DFIRM flood zones are shown in Figure 4-25.

Figure 4-25 Santee Sioux Nation – FEMA DFIRM Flood Zones



Flood extents are usually measured in depths of flooding, aerial extent of the floodplain, as well as flood zones that a location falls in (i.e., 1% or 0.2% annual chance flood). Expected flood depths in the SSN vary and are not well defined. Flood durations in the SSN tend to be short to medium term, until flood waters move downstream. Aerial flood extents (i.e., flooded acres analysis) from the FEMA DFIRMs is shown on Table 4-26.

Table 4-26 Santee Sioux Nation – Flooded Acres Summary by FEMA DFIRM Flood Zone

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood	6,697	6.22%	885	5.78%	5,813	6.30%
0.2% Annual Chance Flood*	862	0.80%	165	1.08%	697	0.76%
SSN Total	**7,559**	**7.02%**	**1,049**	**6.85%**	**6,510**	**7.05%**

Source: FEMA 10/2/2015 DFIRM

*This acre count only includes those acres in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all acres in the 1% annual chance floodplain.

Past Occurrences

Disaster Declaration History

There have been 14 federal disaster declarations due to flooding in Knox County as shown in Table 4-27.

Table 4-27 Knox County Disaster Declarations from Flood 1950-2023

Disaster Type	Federal Declarations	
	Count	Years
Flood (with heavy rain and storms)	14	1967,1971 (twice), 1978, 2003, 2005, 2006, 2007, 2010 (twice), 2011 (twice), 2019, 2022

Source: FEMA

NCDC Events

The NCDC tracks flood events for Knox County since 1996. These are shown on Table 4-28. Specific events affecting the SSN are discussed below the table.

*Table 4-28 Knox County NCDC Flooding Events 1/1/1996-1/31/2023**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Flash Flood	17	0	0	0	0	$79,000	$10,000
Flood	21	0	0	0	0	$151,000	$0
Total	**38**	**0**	**0**	**0**	**0**	**$230,000**	**$10,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of the SSN and outside of Knox County.

7/21/1999 – Rainfall of around 5 inches backed up storm sewers in Bloomfield and caused flash flooding along Little Bazile Creek, closing the main street through town for several hours. Santee's water supply/well field was also flooded.

9/23/2010 – Rainfall of 6 to 7 inches fell on Sept. 22nd which produced flash flooding along Bazile Creek reducing Highway 12 to one lane east of Niobrara.

Tribal Hazard Mitigation Planning Committee Events

The THMPC noted that Knox County experienced two 100+-year flood events in less than 10 years. The first event occurred in **2011** and the second occurred in **2019**.

In **2011**, a Missouri River flood occurred, due to heavy rainfall in May and melting snowpack in the mountains that went into the river. Highway 12 between Santee and Niobrara was closed that entire summer, forcing vehicles to drive on gravel roads to reach the town of Niobrara. Water covered the road. At that time, Niobrara had the closest mechanic shop, bank, alternate grocery store, hair salon, and some Santee children attended school in Niobrara. Early in the flood, the 54D/Hwy 12 area was also flooded for a few days which blocked some customers from reaching the Old Ohiya Casino, and Feather Hill gas station which then was ¼ mile from 54D junction. This was a negative impact to the Ohiya Casino and Feather Hill gas station. Other businesses suffered as a result of the road closure. The flooding carried over into September and the highways were not reopened until then. There was damage to the SSN wells, which provide water to the SSN.

In **2019** Winter Storm Ulmer developed on March 12th and slowly moved across the Midwest including Nebraska. Due to heavy precipitation on frozen ground and melting snowpack, numerous water systems (rivers and watersheds) were overwhelmed and failed. As detailed above in Section 4.3.6, the Spencer Dam upstream of the SSN failed. In other areas, floodwater released by ice jams breaking up destroyed roads, bridges, and levees. The washed-out bridges made travel in the area very difficult. It was estimated that the flooding caused over $1,200,000 in damage.

Specific to the SSN, floodwaters affected the Tribe. Floodwaters in the Village of Santee rose, and difficulty arose as many of the drains were plugged with ice, debris, and trash. Tribe members waded in waist deep freezing water to find the drains, clean them, and then remove the grates so the water could flow faster into the drains. This can be seen in Figure 4-26. It is believed that 10 grates were lifted out of the freezing water during this flood. In addition to the flooding in the Village of Santee, the SSN saw floodwaters overtop the bridge at Bazile Creek near Highway 54D and Highway 12 (as shown on Figure 4-27). The North Central Public Power District noted they had a distribution line down for 48 hours that fed the SSN. Repairs were made at a cost of $220,000. Many power lines were damaged during this time (see Figure 4-29). Generators had to be brought in to power the Village of Santee. These large diesel generators (shown on Figure 4-28) burned 60,000 gallons of diesel during that time. Damages were reported to homes (as shown on Figure 4-30).

The SSN noted other issues. Water that is piped to the community of Santee and to the residents along the Highway 54D spur was found to have lost pressure. It was thought that a pipe had broken and leaked. Utility crews and willing helpers found a suspected leak and began to pump water out of a ditch to get at the affected pipe. It was discovered, after two days of pumping, that the leak was in a different location.

An o-ring seal had given way. This was able to be fixed quickly once discovered. This can be seen on Figure 4-31.

Additionally, on March 27th, 2019, the TaTanka Golf Course noted that the well head that supplies water from Bazile Creek was destroyed. That well pumped water from Bazile Creek and filled a pond on the golf course, which is then in turn used to water the greens.

Both the SSN and Knox County were granted a federal disaster declaration (DR-4420). The Santee Sioux Nation estimated that damage in the neighborhood of $30 million occurred.

Figure 4-26 Street Flooding and Drain Cleaning in Santee

Source: SSN

Figure 4-27 Flooding at 54D and Highway 12

Source: SSN

Figure 4-28 Diesel Generators Used to Power SSN Facilities

Source: SSN

Figure 4-29 Downed Power Lines from 2019 Storms

Source: SSN

Figure 4-30 Basement Damages from 2019 Floods

Source: SSN

Figure 4-31 Replacing the Seal in the Water System Piping

Source: SSN

Probability of Future Occurrences

1% Annual Chance Flood

Occasional—This is the flood that has a 1- percent chance of being equaled or exceeded in the SSN in any given year. Thus, the 1% annual chance flood could occur more than once in a relatively short period of time.

0.2% Annual Chance Flood

Unlikely—The flood has a 0.2 percent chance of being equaled or exceeded in the SSN in any given year.

Climate Change and Flood

The 2021 State of Nebraska Hazard Mitigation Plan noted that predicting flooding depends on the ability to forecast fundamental meteorological surface parameters. Based on the historical record, climate is inherently variable making it difficult for climate scientists to predict long-term precipitation models. The publication, Understanding and Assessing Climate Change: Implications for Nebraska (University of Nebraska-Lincoln), dated September 2014, state that there is a large degree of uncertainty related to impacts of climate change to precipitation for regional and smaller; however, agreement among modeling studies along with the understanding of the temperature-atmospheric moisture relationship leads to the conclusion that there is virtual certainty the global mean precipitation will increase in the long term. There have already been observed changes in precipitation, and projected changes are expected to vary considerably across the globe and by season. General consensus is that wet areas will become wetter with some regional and seasonal deviations. In addition, the publication provides the following statement related to the potential for more extreme events:

> ***Scientists predict that it is likely that heavy precipitation events will increase in frequency, intensity, and amount in response to warmer temperatures. Additionally, El Niño is expected (with high confidence) to remain the dominant mode of climate variability, and associated precipitation variability is expected to intensify, though specific regional responses may vary. (Understanding and Assessing Climate Change, p. 27)***

As storms become more frequent or severe the risk of flooding also increases depending on the location of storms.

The 2023 Tri-County Hazard Mitigation Plan also noted that NOAA has created the Climate Mapping for Resilience and Adaptation tool that looks at how different emission scenarios affect climatological hazards. Table 4-29 shows that the annual total precipitation is expected to increase in both low emissions (Representative Concentration Pathway or RCP) and high emission scenarios. Changes will likely occur in timing and intensity. Winter and spring will be 15-25% wetter, summer will be 5-15% drier, and fall will be 5% wetter. Table 4-30 shows the annual number of days that exceed the 99th percentile precipitation increases as time goes on in both the lower emissions and higher emissions scenario.

Table 4-29 Santee Sioux Nation – Average Annual Total Precipitation Anticipated Changes

County	Emissions Scenario	Historical (1976-2005)	Early Century (2015-2044)	Mid-Century (2035-2064)	Late Century (2070-2099)
Knox County	Lower Emissions (RCP 4.5)	24.7	25.3	25.5	25.7
	Higher Emissions (RCP 8.5)	24.7	25.2	25.7	26.2

Source: 2023 Tri-County Hazard Mitigation Plan

Table 4-30 Santee Sioux Nation – Annual Days that exceed the 99^{h} Percentile Precipitation

County	Emissions Scenario	Historical (1976-2005)	Early Century (2015-2044)	Mid-Century (2035-2064)	Late Century (2070-2099)
Knox County	Lower Emissions (RCP 4.5)	4.3	4.9	5.0	5.2
	Higher Emissions (RCP 8.5)	4.3	4.8	5.2	5.8

Source: 2023 Tri-County Hazard Mitigation Plan

Vulnerability Assessment

Vulnerability—Medium

Historically, the SSN has always been at risk to flooding during the spring runoff season from April to May. Heavy rains and storms may cause summer flooding. The Knox County FIS noted that floods result from prolonged heavy rainfall and are characterized by high peak flows of moderate duration and by a large volume of runoff. Flooding is more severe when antecedent rainfall has resulted in saturated ground conditions. Several areas of the SSN are subject to flooding by the overtopping of rivers and creeks, levee failure, and the failure of urban drainage systems that cannot accommodate large volumes of water during severe rainstorms. In addition to the major rivers, there are many streams and creeks that serve the drainage needs of the SSN and communities surrounding it. There is significant threat of flooding in areas of the SSN from some of these streams. These streams can be prone to rapid flooding with little notice.

Health Hazards from Flooding

According to FEMA, certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm, and industrial chemicals. Pastures and areas where cattle and other livestock are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e. coli and other disease-causing agents.

The second type of health problem arises after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged structure puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Values at Risk

The SSN has mapped FEMA flood hazard areas. GIS was used to determine the possible impacts of flooding within the SSN and how the risk varies across the Tribe. The following methodology was followed in determining improved parcel counts and values at risk to the 1% and 0.2% annual chance flood events including those located within detailed FEMA flood zones.

Methodology

State of Nebraska 2022 parcel data was used as the basis for the SSN inventory of parcels, values, and acres. Knox County, including the Santee Sioux Nation, has a FEMA effective DFIRM dated 10/2/2015, which was obtained from FEMA's National Flood Hazard Layer to perform the flood analysis.

GIS was used to create a centroid, or point representing the center of the parcel polygon. DFIRM flood data was then overlaid on the parcel layer. For the purposes of this analysis, the flood zone that intersected a parcel centroid was assigned the flood zone for the entire parcel. The parcels and associated values were segregated and analyzed in this fashion to determine parcels and values at risk to the flood hazard for the SSN.

Each of the DFIRM flood zones that begins with the letter 'A' depict the Special Flood Hazard Area, or the 1% annual chance flood event (commonly referred to as the 100-year flood). Table 4-31 explains the difference between DFIRM mapped flood zones within the SSN and within the flood map extent. The effective DFIRM maps for the SSN were shown on Figure 4-25.

Table 4-31 Santee Sioux Nation – DFIRM Flood Zones

Flood Zone	Description
A	1% annual chance flooding: No base flood elevations provided
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood
X (unshaded)	No flood hazard

Source: FEMA

Flood Loss Estimate

The loss estimate for flood is based on the total of improved and contents value. Improved parcels include those with improved structure values identified in the State of Nebraska parcel database. Only improved parcels and the value of their structure improvements were included in the flood loss analysis. The value of land is not included in the loss estimates as generally the land is not at loss to floods, just the value of improvements and structure contents. The land value is represented in the detailed flood tables, but are primarily present to show the value of the land associated with each flood zone.

The land use categories for the SSN was assumed to be residential, and that was used to develop estimated content replacement values (CRV) that are potentially at loss from hazards, using FEMA Hazus methodologies as previously described in Section . The CRVs were added to the improved parcel values.

Once the potential value of affected parcels was calculated, a damage factor was applied to obtain loss estimates by flood zone. When a flood occurs, seldom does the event cause total loss of an area or building. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percentage of damage is primarily related to the flood depth. FEMA's flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The values at risk in the flood analysis tables were refined by applying an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA's Flood Building Loss Table based on an assumed average flood depth of 2 feet. The end result of the flood hazard analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard.

Limitations

It also should be noted that the resulting flood loss analysis may actually be more or less than that presented in the below tables as the SSN may include structures located within the 1% or 0.2% annual chance floodplain that are elevated at or above the level of the base flood elevation, according to local floodplain development requirements.

Flood Analysis Results

Table 4-32 shows a summary table of loss estimates by flood zone for the SSN, and gives potential losses summarized by the 1% and 0.2% annual chance flood event with loss estimate and loss ratios for the SSN. The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all parcels located in the Planning Area as shown in Table 4-7) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator that a community may have more difficulties recovering from a flood. The Tribe should keep in mind that the loss ratio could increase with additional development in the 1% and 0.2% annual chance floodplain unless development is elevated in accordance with the local floodplain management ordinance.

Table 4-32 Santee Sioux Nation – Count and Value of Parcels by FEMA DFIRM 1% and 0.2% Annual Chance Flood Zone*

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Ratio
1% annual chance of flooding	463	66	$11,214,528.40	$858,372.10	$429,186.05	$12,502,087	5.66%
0.2% annual chance of flooding**	457	64	$1,698,224.50	$19,595.68	$9,797.84	$1,727,618	0.78%
Total Affected Area	**920**	**130**	**$12,912,752.90**	**$877,967.78**	**$438,983.89**	**$14,229,704.57**	**6.44%**

Source: FEMA 10/2/2015 DFIRM, State of Nebraska 2022 Parcel Data

*With respect to improved parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

According to the information in Table 4-32, SSN has 66 improved parcels and roughly $12.5 million of structure and contents value in the 1% annual chance floodplain. There are an additional 64 improved parcels and roughly $1.7 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 5.66% and 0.78% indicates that while the SSN does have assets at risk to flood, the Tribe should be able to effectively recover from a major flood event.

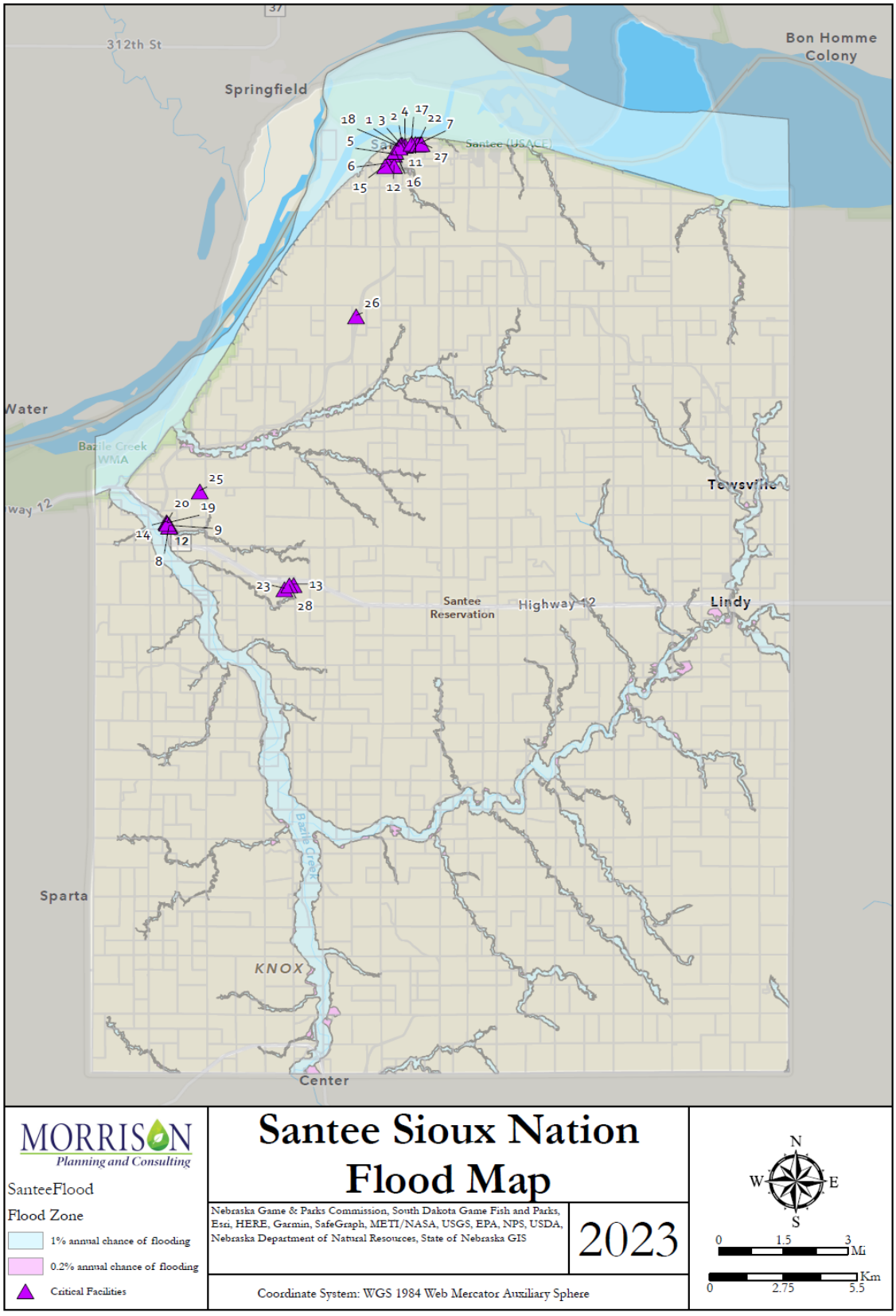
Insurance Coverage, Claims Paid, and Repetitive Losses

The Tribe does not participate in the National Flood Insurance Program.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the SSN to determine critical facilities in the FEMA DFIRM flood zones. Using GIS, the flood zones were overlayed on the critical facility GIS layer. Figure 4-32 shows critical facilities, as well as the DFIRM flood zones. As shown on the map, no critical facilities fall inside the FEMA DFIRM flood zones. As such, no tabular analysis is performed.

Figure 4-32 Santee Sioux Nation – Critical Facilities in FEMA DFIRM Floodplains



Overall Impact

Floods and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the SSN during specific times. Based on the risk assessment, it is evident that floods may have potentially significant impacts to certain areas of the SSN. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values;
- Impact on the overall mental health of the community.

Future Development

Any future development in floodplains should be discouraged to protect future assets. Land-use regulations should be used to limit development in floodplains and other flood prone areas as well as protecting natural flood mitigation features. Buyout programs can be used to eliminate properties located in floodplains, especially properties that have experienced repetitive losses. The Tribe does not participate in the NFIP and does not have an enforceable floodplain ordinance. The BIA and HUD do take flooding into account when siting future developments in the SSN.

4.3.9. Hazardous Material Transportation Release

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the Environmental Protection Agency (EPA), a hazardous material is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous materials can be present in any form; gas, solid, or liquid. Environmental or atmospheric conditions can influence hazardous materials if they are uncontained.

The U.S. Occupational Safety and Health Administration's (OSHA) definition of hazardous material includes any substance or chemical which is a "health hazard" or "physical hazard," including: chemicals which are carcinogens, toxic agents, irritants, corrosives, sensitizers; agents which act on the hematopoietic system; agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, oxidizers, pyrophorics, unstable-reactive or water-reactive; and

chemicals which in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapors, mists or smoke which may have any of the previously mentioned characteristics.

The EPA incorporates the OSHA definition and adds any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment. The EPA maintains a list of 366 chemicals that are considered extremely hazardous substances (EHS). This list was developed under the Superfund Amendments and Reauthorization Act. The presence of EHSs in amounts in excess of a threshold planning quantity requires that certain emergency planning activities be conducted.

A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud or direct contamination of water, people, and property. The effects may involve a local area or many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or be gradual, such as the development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Location and Extent

In and near the SSN are multiple hazardous materials routes. State Road 12 and 54D are hazardous materials routes. Figure 4-33 shows the hazardous materials transportation corridors in the SSN as well as the one-mile buffer zone (on each side of the corridor for a two-mile total buffer) used for this analysis as detailed further in the methodology below. Aerial buffer zone extents are shown on Table 4-33.

Figure 4-33 Santee Sioux Nation – Hazardous Materials Transportation Routes and Buffer Zones

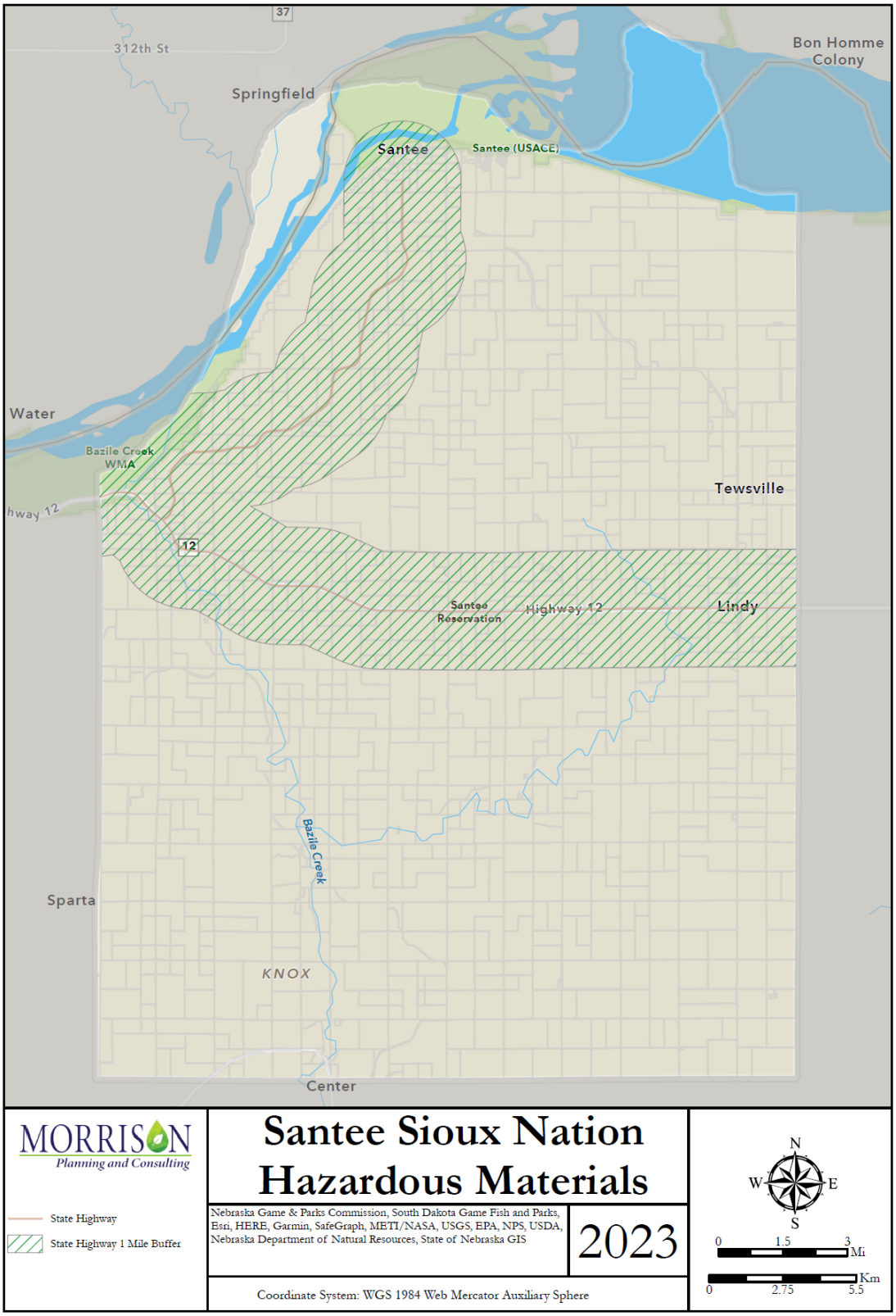


Table 4-33 Santee Sioux Nation – Aerial Extent of Hazardous Materials Buffer Zones

Highway Buffer Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Highway 12 and 54D	28,276.20	0.28%	3,007.60	19.64%	25,268.60	27.37%

Source: Nebraska Department of Transportation

In addition, while most routes are known, the SSN has not quantified the amount of hazardous materials that are transported through it en route to local deliveries or to adjoining counties. Chemicals supporting local industries, such as agriculture operations and agriculture support operations, may transport hazardous materials to and from the facilities and fields.

Accidents involving the transportation of hazardous materials could be just as catastrophic as accidents involving stored chemicals, possibly more so, since the location of a transportation accident is not predictable. The U.S. Department of Transportation (USDOT) divides hazardous materials into nine major hazard classes. A hazard class is a group of materials that share a common major hazardous property, i.e., radioactivity, flammability, etc. These hazard classes include:

- Class 1—Explosives
- Class 2—Compressed Gases
- Class 3—Flammable Liquids
- Class 4—Flammable Solids; Spontaneously Combustible Materials; Dangers When Wet Materials/Water-Reactive Substances
- Class 5—Oxidizing Substances and Organic Peroxides
- Class 6—Toxic Substances and Infectious Substances
- Class 7—Radioactive Materials
- Class 8—Corrosives
- Class 9—Miscellaneous Hazardous Materials/Products, Substances, or Organisms

The speed of onset of a hazardous materials spill is generally short. The duration is typically short as well, though certain chemicals can pollute earth and groundwater for long periods of time. The actual extent of any given incident will depend on the type of release, location, and nature and extent of any release.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations for hazardous materials in Knox County, as shown on Table 4-4.

NCDC Events

The NCDC does not track hazardous materials events.

Pipeline and Hazardous Materials Safety Administration Events

The USDOT Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety performs a range of functions to support the safe transport of hazardous materials. One of these functions is the tracking of hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in the SSN. As shown, there have been no highway hazardous materials incidents since 1970 in the SSN is shown in Table 4-34.

Table 4-34 Santee Sioux Nation - Hazardous Materials Transportation Incidents Since 1970

Date of Incident	Incident Route	Mode of Transportation	Commodity Short Name	Quantity Released	Amount of Damages
–	–	–	–	–	–

Source: PHMSA Database – Search dates 01/01/1970 – 07/01/2023

Tribal Hazard Mitigation Planning Committee Events

The SSN noted no past occurrences that caused damages or injuries on SSN lands.

Probability of Future Occurrence

Unlikely – Given that no hazardous materials incidents have happened in transport through the SSN in the past 53 years, it is unlikely a major hazardous materials incident will occur in the SSN. It should be noted, however, that small hazardous materials spills happen often and are cleaned up locally and go unreported to national databases. According to PHMSA, most incidences are related to releases during loading and unloading of cargo, and the release of fluids/materials from the transporting vehicles themselves and not the cargo.

Climate Change and Hazardous Materials

Climate change is unlikely to affect hazardous materials transportation incidents.

Vulnerability Assessment

Vulnerability—Low

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. The most significant impact from hazardous materials transport is life safety. Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key SSN values relative to the hazardous materials transportation corridors identified above.

Methodology: Buffer Zone

An analysis of the potential vulnerability of the SSN to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. To evaluate the areas most vulnerable,

a one-mile buffer was applied to both sides of Highways 12 and 54D. The result is a two-mile buffer zone around each transportation corridor that is included in this analysis. The buffer distance was based on guidelines in the USDOT's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this Plan, a buffer distance of one mile was used on either side of the transportation corridor. Actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

Figure 4-33 above showed the hazardous materials transportation corridors in the SSN as well as the one-mile buffer zone (on each side of the corridor for a two-mile total buffer) used this analysis as detailed further in the methodology below.

Values at Risk

During a hazardous materials transportation spill, it is generally the people that are at risk to the effects of the spill. During a spill, buildings, property, and their values are at a lessor risk; however, given the location of hazardous materials routes in the SSN, an analysis is performed here. Analysis results for the SSN are summarized in Table 4-35, which summarizes by total parcel counts, improved parcel counts, and their improved and land values and the estimated contents replacement values based on the CRV factors detailed in Table 4-6.

Table 4-35 Santee Sioux Nation – Summary Count and Value of Parcels in all Hazardous Materials Buffer Zones and for all Transportation Routes

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Santee Sioux Nation	303	61	$51,642,440.00	$3,907,565.00	$1,953,782.50	$57,503,787.50

Source: Nebraska Department of Transportation, State of Nebraska 2022 Parcel Data

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the SSN to determine critical facilities in the hazardous material transportation routes. Using GIS, the hazardous materials buffer zones were overlayed on the critical facility GIS layer. Figure 4-34 shows critical facilities, as well as the hazardous materials buffer zones. Critical facilities that fall in the hazardous materials buffer zones are detailed in Table 4-8.

Figure 4-34 Santee Sioux Nation – Critical Facilities in Hazardous Materials Buffer Zones

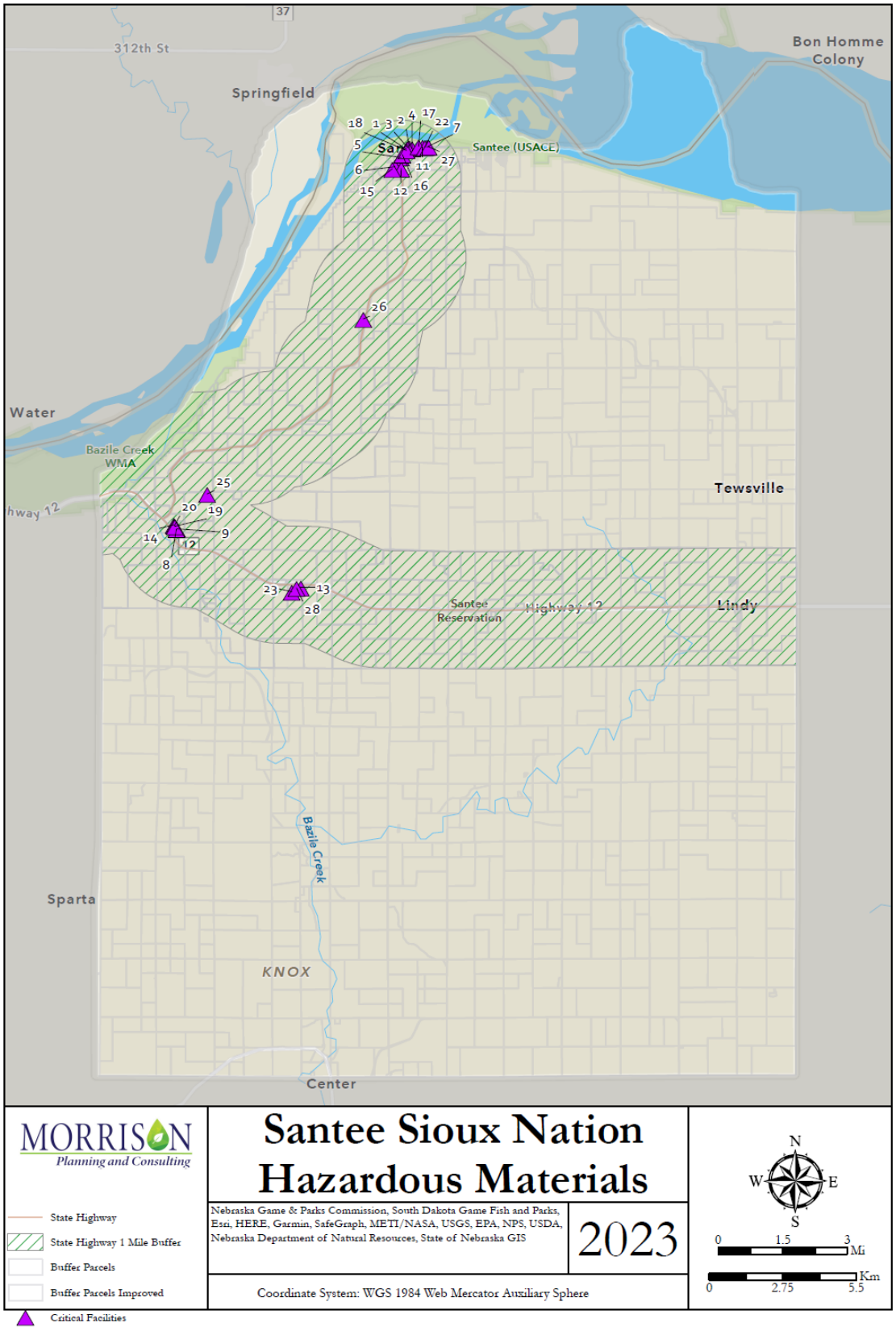


Table 4-36 Santee Sioux Nation – Critical Facilities in Hazardous Materials Transportation Buffer Zones

Location ID	Facility Name	Value
1	Main Tribal Office	$2,867,600
2	Tribal Court	$246,742
3	Transfer Station	$37,343
4	Utility Office	$255,409
5	Day Care Center	$24,503
6	Cultural Museum	$539,280
7	Police Station	$348,075
8	Land Management Office	$1,713,987
9	Warriors Lodge/Youth Center	$251,980
10	Metal Quonset	$40,947
11	Teen Center	$219,739
12	Grocery Store	$1,429,044
13	Feather Hill Express Station (Vacant)	$174,475
14	Dakota Transit	$187,785
15	Medical Clinic	$18,532,400
16	Lakeview Gas & C-Store	$850,200
17	Fire House	$566,030
18	Domestic Violence Home	$316,292
19	Industrial Park Building (Dollar Plus)	$2,093,558
20	Feather Hill Express Station	$3,252,050
21	Educational Residential Facility	$387,340
22	Community Swimming Pool	$585,054
23	Tatanka Golf Course	$6,352,095
24	Not Used	–
25	S.T. Ranch	$656,123
26	Kaylon's House and Shop	$314,366
27	Santee Mini Storage	$107,214
28	Ohiya Casino	$20,801,032

Source: Nebraska Department of Transportation, SSN

Overall Community Impacts

Impacts from hazardous materials transportation incidents vary by location and severity of any given event and will likely only affect certain areas of the SSN during specific times. Based on the risk assessment, it is evident that hazardous materials spills will continue to have potential economic impacts to certain areas of the SSN. However, many of the spills in the SSN are minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Future Development

Development will continue to happen within hazardous materials transportation corridors. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route.

4.3.10. Landslide

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the SSN. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the United States Geological Survey, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events.

Location and Extent

Natural conditions that contribute to landslide include

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in Section 4.3.12)
- Road building, excavation, and grading

Destructive landslides usually occur very suddenly with little or no warning time and are short in duration. But sometimes, they can continue over a prolonged period of time. Areas of specific landslide risk are shown below in the discussion on Past Occurrences.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations associated with landslides in Knox County, as shown in Table 4-4.

NCDC Events

The NCDC contains no records for landslides in Knox County.

University of Nebraska Landslide Events

The University of Nebraska's Collection of Nebraska Landslides reports events as they occur in each county. There were 2 landslide events that occurred between 1960 and 2020 that occurred in the SSN:

- HY S54D 7 MI WEST OF SANTEE ON SOUTHEAST FACING SLOPE MP02+50
- HY S54D 5.5 MI W SANTEE ON SOUTHEAST FACING SLOPE MP03+85

These areas have seen repetitive slides over time.

Tribal Hazard Mitigation Planning Committee Events

In the Santee Sioux Nation, there are certain areas of known landslide risk:

- Slides Hill North, Sec 19-33-4 Lindy Road 100 ft in length
- Union Township Sec. 3-32-5 State Hwy 54D Spur 50 yards in length
- Union Township Sec. 33-32-5 County road 13, 300 yards in length
- Harrison Township Sec. 7-31-4 County Road 887 100 yards in length

These areas have seen repetitive slides over time.

Probability of Future Occurrences

Likely — There are landslide areas within the SSN. Due to the topography in and around the SSN and the past occurrences, future occurrences of landslides are considered likely.

Climate Change and Landslides

While specific projections related to landslide events from climate change cannot be made, certain assumptions can be made based on weather/climatic phenomenon that influence landslides. Increased precipitation may result from climate change. Increased precipitation makes susceptible areas more vulnerable to landslide potential. More information on precipitation increases can be found in Section 4.3.3.

Vulnerability Assessment

Vulnerability—Medium

Landslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides can occur on small, steep stream channels and are often mistaken for floods. However, landslides may be much more destructive than floods because of their higher densities, high debris loads, and high velocities. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas.

Vulnerability to and Impacts from Landslide

The 2023 Tri-County Plan noted that rapidly moving landslides present a risk to human life. Landslides can be massive, or they may disturb only a few cubic feet of material. The majority of events in the SSN are likely to cause limited property damage; as well as limited or no deaths and injuries. These may affect infrastructure. Persons living in or traveling through areas prone to rapidly moving landslides should take caution. Slow moving landslides can cause significant property damage but are less likely to result in serious human injuries.

Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the SSN during specific times. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Future Development

Future development is expected to be sited away from landslide risk areas.

4.3.11. Pandemic

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur

when a new virus appears against which the human population has little to no immunity and for which there is no vaccine. A pandemic spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The CDC has been working closely with other countries and the WHO to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning, preparation, and response. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the SSN is at risk, as pandemic is a regional, national, and international event. The speed of onset of a pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu and the more recent Covid-19 pandemic. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by the numbers who die.

Past Occurrences

Disaster Declaration History

There have been three federal disaster declarations due to pandemic, as shown in Table 4-37.

Table 4-37 Santee Sioux Nation – Federal Pandemic Disaster Declarations 1950-2023

Disaster Type	Federal Declarations	
	Count	Years
Pandemic	3	2020 (three)

Source: FEMA

NCDC Events

The NCDC does not track pandemic.

WHO Events

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1),** (aka the Spanish Flu**),** is the catastrophe against which all modern pandemics are measured. It is estimated that approximately 20 to 40 percent of the worldwide population became ill and that over 50 million people died. Approximately 675,000 deaths from the flu occurred in the U.S. alone.
- The **February 1957-1958 Influenza Pandemic (H2N2)** (aka the Asian Flu) was first identified in the Far East. Immunity to this strain was rare in people less than 65 years of age, and a pandemic was predicted. In preparation, vaccine production began in late May 1957, and health officials increased surveillance for flu outbreaks. Unlike the virus that caused the 1918 pandemic, the 1957 pandemic virus was quickly identified, due to advances in scientific technology. Vaccine was available in limited supply by August 1957. The virus came to the U.S. quietly, with a series of small outbreaks over the summer of 1957. When U.S. children went back to school in the fall, they spread the disease in

classrooms and brought it home to their families. Infection rates were highest among school children, young adults, and pregnant women in October 1957. Most influenza-and pneumonia-related deaths occurred between September 1957 and March 1958. The elderly had the highest rates of death. By December 1957, the worst seemed to be over. However, during January and February 1958, there was another wave of illness among the elderly. This is an example of the potential "second wave" of infections that can develop during a pandemic. The disease infects one group of people first, infections appear to decrease and then infections increase in a different part of the population. Although the Asian flu pandemic was not as devastating as the 1918-1919 flu, about 69,800 people in the U.S. died.

- The **1968 Influenza Pandemic (H3N2)** was first detected in Hong Kong (aka the Hong Kong Flu). The first cases in the U.S. were detected as early as September of that year, but illness did not become widespread in the U.S. until December. Deaths from this virus peaked in December 1968 and January 1969. Those over the age of 65 were most likely to die. The same virus returned in 1970 and 1972. The number of deaths between September 1968 and March 1969 for this pandemic was 33,800, making it the mildest pandemic in the 20th century.

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1**)— 2009 H1N1 (sometimes called "swine flu") was a new influenza virus causing illness in people. This virus was originally referred to as "swine flu" because laboratory testing showed that many of the genes in this new virus were very similar to influenza viruses that normally occur in pigs (swine) in North America. But further study showed that this virus was very different from what normally circulates in North American pigs. It had two genes from flu viruses that normally circulate in pigs in Europe and Asia and bird (avian) genes and human genes. Scientists call this a "quadruple reassortant" virus. This virus spread from person-to-person worldwide, probably in much the same way that regular seasonal influenza viruses spread. On June 11, 2009, the WHO) signaled that a pandemic of 2009 H1N1 flu was underway. It was first detected in the United States in early 2009 and spread to the world later that year. About 70 percent of people who were hospitalized with this 2009 H1N1 virus had one or more medical conditions previously recognized as placing people at "high risk" of serious seasonal flu-related complications. This included pregnancy, diabetes, heart disease, asthma, and kidney disease. Young children were also at high risk of serious complications from 2009 H1N1, just as they are from seasonal flu. And while people 65 and older were the least likely to be infected with 2009 H1N1 flu, if they got sick, they were also at "high risk" of developing serious complications from their illness. Some studies estimated that 11 to 21 percent of the global population at the time—or around 700 million to 1.4 billion people (of a total 6.8 billion)—contracted the illness. This was more than the number of people infected by the Spanish flu pandemic, but only resulted in about 150,000 to 575,000 fatalities for the 2009 pandemic. A follow-up study done in September 2010 showed that the risk of serious illness resulting from the 2009 H1N1 flu was no higher than that of the yearly seasonal flu. For comparison, the WHO estimates that 250,000 to 500,000 people die of seasonal flu annually.
- **2019/2023** COVID 19 – During the creation of this THMP, the world was and the endemic stage of COVID-19 (known also as coronavirus). Coronaviruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19. COVID-19 is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak

began in Wuhan, China, in December 2019. The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around 1 out of every 6 people who get COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical attention. As of the beginning of March 2023, there had been roughly 676 million cases worldwide, with 6.9 million deaths.

Tribal Hazard Mitigation Planning Committee Events

Staff from the Santee Health and Wellness Center noted issues from the Covid 19 pandemic. Nearly every person residing on the reservation had Covid once or more times (some 1,000 – 1,100 people). Roughly 20 people were hospitalized strictly from Covid. There were 2 deaths due to Covid, one elderly female early on and one middle aged male who delayed seeking treatment and left the hospital against medical advice.

The Covid task force met daily for over 1.5 years, with multiple mitigation strategies implemented. The SSN worked extensively with the North Central District Health Department (NCDHD) out of O'Neill NE regarding testing and vaccination. Many resources (mostly supplies) from IHS and FEMA were utilized. The Health Center was responsible for contact tracing, quarantine and isolation of all tribal members residing on the reservation. The State did nothing in regard to this for the Tribe.

NCDHD, in their Covid After Action Report, noted that testing capabilities early in the incident were extremely limited, as supplies and tests were not readily available. Challenges were experienced with laboratory backlog, leading to a delay in test results. This had a significant impact on prescribing quarantine measures and contact tracing. Some of the strengths experienced under this objective was the affordability as it was free to undergo testing for COVID-19. Additionally, testing capabilities increased as the disaster progressed as tests became more available, and alternative testing options were developed.

Probability of Future Occurrence

Likely – The calculation for future occurrence of pandemic must first be considered in light of circumstances. The diseases are naturally occurring in the populations that reside in the SSN. In addition, this Plan is not examining the pandemic potential of these diseases, but instead examines when these diseases manifest in severe injury or fatalities among humans. Given these assumptions and the five outbreaks since 1900, the probability of future occurrence is considered likely.

Climate Change and Pandemic

According to the WHO, there are three categories of research into the linkages between climatic conditions and infectious disease transmission. The first examines evidence from the recent past of associations between climate variability and infectious disease occurrence. The second looks at early indicators of already-emerging infectious disease impacts of long-term climate change. The third uses the above

evidence to create predictive models to estimate the future burden of infectious disease under projected climate change scenarios.

Early Impacts of Climate Change on Pandemic

There is much evidence of associations between climatic conditions and infectious diseases. These include several infectious diseases, health impacts of temperature extremes and impacts of extreme climatic and weather events. Changes in infectious disease transmission patterns are a likely major consequence of climate change. More needs to be learned about the underlying complex causal relationships and apply this information to the prediction of future impacts, using more complete, better validated, integrated, models.

Vulnerability Assessment

Vulnerability—Medium

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat a pandemic. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of a pandemic by staying home, or "self-quarantining," if they suspect they are infected. A Pandemic does not affect the buildings, critical facilities, and infrastructure in the Tribe. Pandemics can have varying levels of impact to the citizens of the SSN, depending on the nature of the pandemic.

Vulnerability to and Impacts from Pandemic

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently), and unemployment rose significantly. Supply chains for food can be interrupted. During Covid, vulnerable populations such as those who were immunocompromised were the most affected.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the Trube could increase exposure to a pandemic, and increase the ability of each disease to be transmitted among the population of the Santee Sioux Nation. If the median age of Tribal residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

4.3.12. Wildfire

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Tribe. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds. Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Economic losses could also result. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides and mudflows, and erosion during the rainy season. The SSN noted that additional losses could occur if North Central Public Power District lines are damaged during extreme fire weather conditions. This is discussed in greater detail at the end of Section 4.3.1.

Location and Extent

Wildfire is part of SSN and Nebraska's natural ecology. However, its danger and cost have increased as fire-prone areas across the State have been increasing as well. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Generally, there are four major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions.

- **Fuel** – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also, to be considered as a fuel source are manmade structures, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is a primary factor that is under human control.
- **Topography** – An area's terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.
- **Weather –** Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is the most treacherous weather factor. The greater a wind, the faster a fire will spread and the more intense it will be. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides.
- **Human Actions** – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes and

are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur.

The 2023 Tri-County (including Knox County) Hazard Mitigation Plan noted that the areas most at-risk from wildfire are in the WUI surrounding municipalities and in the canyons and bluffs along the Missouri and Niobrara Rivers, where there are heavy fuels, rough terrain, and limited access. Homes and other structures in these locations are at increased risk due to these factors. Locations of special concern identified by local fire districts and steering committee members include residential and recreational developments along the Missouri and Niobrara Rivers.

Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time or may have durations lasting for a week or more. Wildfire can affect any area of the SSN; however, the Nebraska Forest Service has mapped areas in the State that are at greater or lesser risk to wildfire. Methodologies for this analysis and maps showing the various Wildfire Risk Levels can be found in the Vulnerability Assessment below. Geographic extents of wildfire can be seen in Table 4-38 by Wildfire Risk Level.

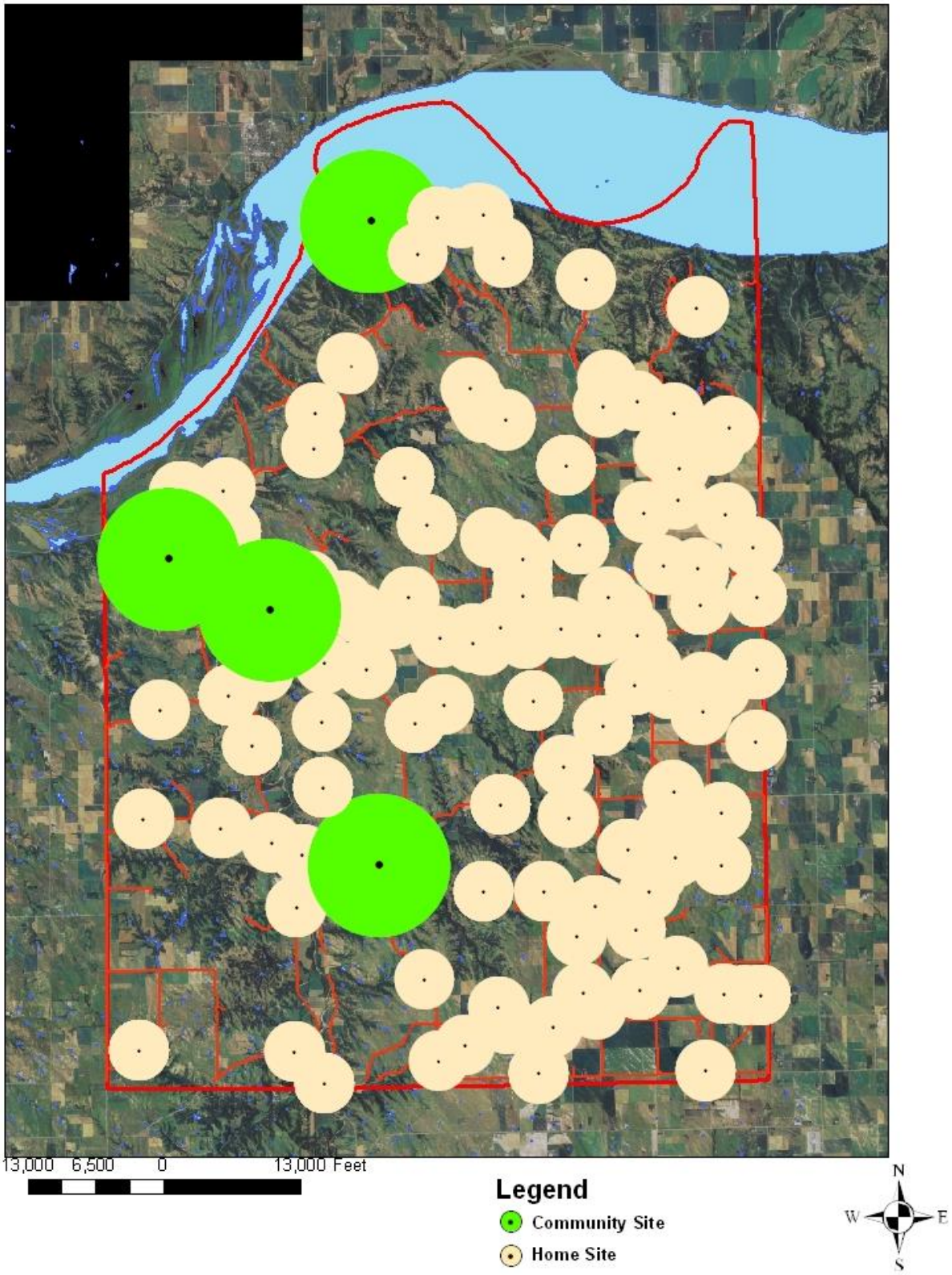
Table 4-38 Santee Sioux Nation – Geographical Extents of Wildfire Risk Levels

Wildfire Risk Level	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	1,486	1.38%	434	2.83%	1,052	1.14%
High	14,606	13.57%	2,013	13.15%	12,593	13.64%
Moderate	79,414	73.79%	11,458	74.83%	67,956	73.61%
Low	12,120	11.26%	1,408	9.19%	10,712	11.60%
Total	**107,626**	**100.00%**	**15,313**	**100.00%**	**92,313**	**100.00%**

Source: Nebraska Forest Service

In addition to the Nebraska Forest Service Wildfire Risk areas, the SSN Community Wildfire Protection Plan provided wildland-urban interface (WUI) maps for jurisdictions in the SSN. This is shown on Figure 4-35 for the Tribe.

Figure 4-35 Santee Sioux Nation – Wildland Urban Interface



Source: 2011 Santee Sioux Nation Community Wildfire Protection Plan

Past Occurrences

Disaster Declaration History

There have been no federal disaster declarations due to wildfire in Knox County. This can be seen in Table 4-4

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1993. No wildfires were shown in the database (as shown above in Table 4-10).

BIA Fire Events

The BIA provided three fire events that occurred in the SSN since 2012:

- March 10, 2012, 6 Pack Fire
- April 8, 2014, Bazile Creek Fire
- November 6, 2020, Campbell Fire

Tribal Hazard Mitigation Planning Committee Events

The THMPC noted an event in March of 2012. A fire near the "6 Pack" housing complex near the present day Ohiya Casino and Resort occurred. Wind and drought contributed to fire spreading rapidly in the surrounding areas. It is officially documented that 1,100 acres burned in the 6 Pack fire. The SSN felt it more likely exceeded 2,000 acres. The fire started late morning or early afternoon, near some housing units located at 53121 Hwy 12 Niobrara, NE nearly directly across present day Ohiya Casino. Along the highway, fire spread from Hwy 12 to the north to finally being stopped just before Hwy 54D and 894 Rd on Santee Indian Reservation. The Fire Dept. from across Knox County joined to help stop the fire, which slowed down the evening of March 12 but was reported to continue burning slowly in some areas, according to farmers and other private landowners. Traffic was slowed down because of smoke and police and fire dept were on road directing traffic in at least one area. The fire burned some pasture land of the ST Bar Ranch and land of other private landowners.

Probability of Future Occurrences

Highly Likely — Conventional thought states that from May to October of each year, the SSN faces a wildland fire threat. The SSN has the topography, weather, and fuels for wildfires to start and burn each year. Smoke and air quality risk to the SSN do still exist from these fires outside of SSN boundaries.

Climate Change and Wildfire

Climate change and its effect on wildfire near the SSN has been discussed by the 2021 Nebraska State Hazard Mitigation Plan. That Plan noted that wildfire characteristics are highly dependent on vegetation as a fuel source. Increases in temperatures and longer periods of drought or dry period can lead to an increase in wildfires and contribute to faster growth. Prolonged drought can lead to dead or dying vegetation providing additional fuel for fires. Meteorological surface parameters can influence the extent

of wildfire when conditions include low amounts of precipitation, low soil moisture, wind, relative humidity and high temperature. Climate is inherently variable, making it difficult for climate scientists to predict these conditions for more than a few months in advance for most locations. In addition, anomalies of precipitation and temperature may last from several months to several decades. Duration of drought-causing climate events depends on air–sea interactions, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of dynamically unstable synoptic weather systems at the global scale.

In addition to this, the 2023 Tri-County LHMP Update noted that rising temperatures will likely increase the frequency and intensity of grass/wildfires. Warmer temperatures cause snow to melt sooner and create drier soils and forests, which can ignite fires quickly and cause them to spread rapidly. Additionally, warmer nighttime temperatures contribute to the continued spread of wildfires over multiple days. Probable Futures put together maps of dryness, and estimated changes in wildfire danger days. These are contained in Table 4-39.

Table 4-39 Santee Sioux Nation – Change in Wildfire Danger Days

	Warming Scenarios			
	1°C	1.5°C	2°C	3°C
Change in Wildfire Danger Days	-6 to 6 days per year	-6 to 6 days per year	-6 to 6 days per year	-6 to 6 days per year
	Avg. 4 days	Avg. 8 days	Avg. 11 days	Avg. 18 days

Source: probablefutures.org

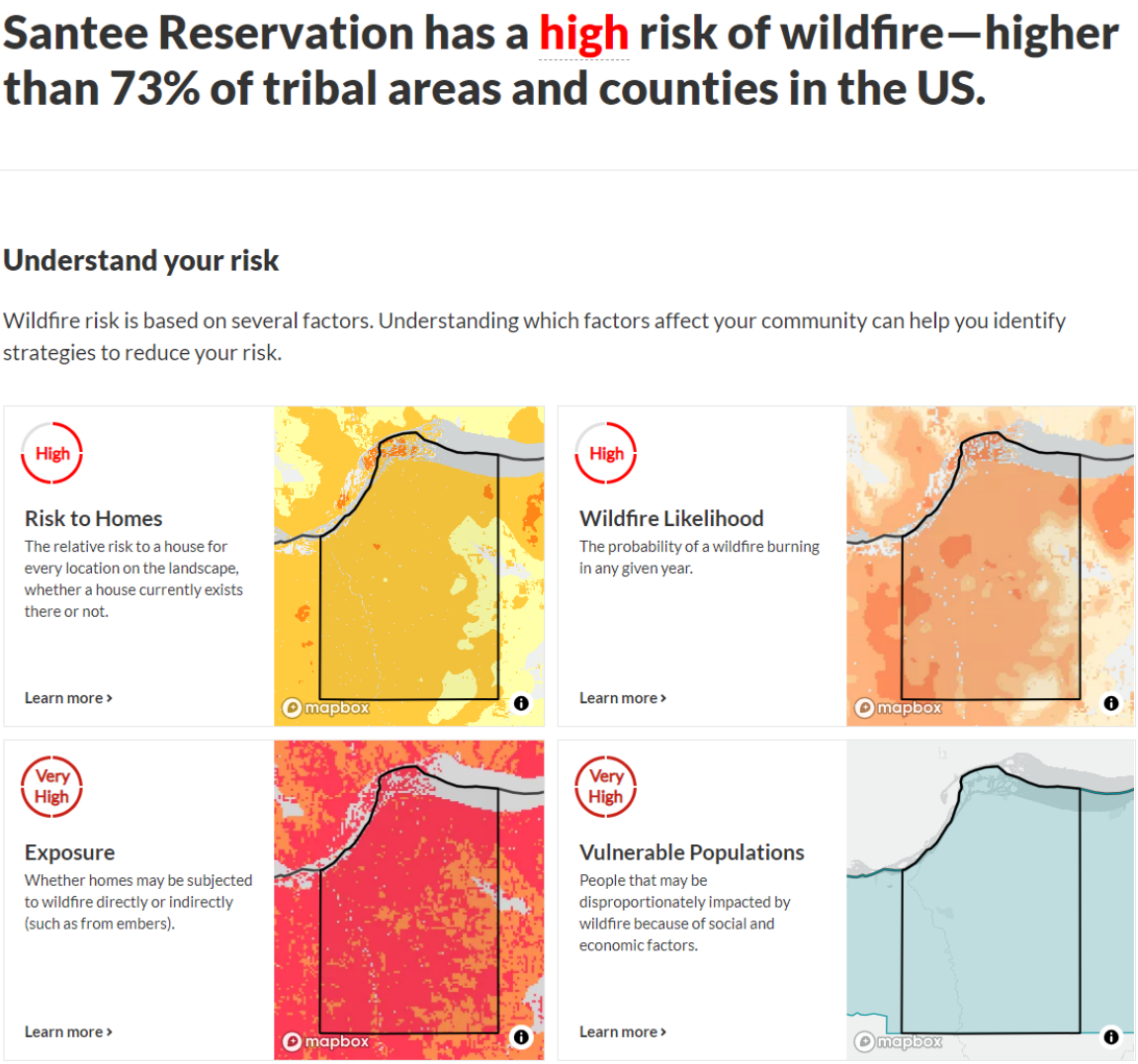
Vulnerability Assessment

Vulnerability—Medium

Risk and vulnerability to the SSN from wildfire is of some concern. Wildfires are a growing hazard in most regions of the United States, posing a threat to life and property, particularly where rural lands meet developed areas or where local economies are heavily dependent on open agricultural land. Although fire is a natural and often beneficial process, fire suppression can lead to more severe fires due to the buildup of vegetation, which creates more fuel and increases the intensity and devastation of future fires.

The SSN is vulnerable to wildfire. The State of Nebraska Forest Service has a wildfire risk map for the entire State of Nebraska. In that map, Wildfire Risk is a measure of the likelihood of a fire starting and spreading to a location. There are four potential scores for a risk level: Low, Moderate, High, and Very High. Wildfire risk from that database is shown on Figure 4-36.

Figure 4-36 Santee Sioux Nation – Wildfire Vulnerability



Source: Nebraska Forest Service Wildfire Risk Explorer

Total Values at Risk

It is important to evaluate or quantify the SSN's risk to wildfire. The SSN has mapped data which provides a variety of fire hazard information for Nebraska communities. Utilizing data from the Nebraska Forest Service Wildfire Risk Explorer, GIS was used to determine the possible impacts of wildfire within the SSN and how the wildfire risk varies across the Planning Area.

Wildfire Risk Mapping Methodology

Nebraska Forest Service Wildfire Risk Explore details wildfire risk areas within the SSN and was utilized to determine the locations, numbers, types, and values of land and structures falling within these mapped areas. The following sections provide details on the methodology and results for this analysis.

The Wildfire Risk layer shows the predicted wildfire risk of a location. Wildfire Risk is a measure of the likelihood of a fire starting and spreading to a location. By incorporating the predicted wildfire severity and wildfire frequency in that location, the risk layer gives a comprehensive view of the threat context a structure is exposed to. Attributes considered in the risk calculation for each fireshed include simulated fire frequency; fire severity based on topography, weather patterns, and fuel types; distance to fire stations; potential for crown fire; percentage of non-burnable area; distance to roads; distance to water; terrain slope; and aspect. Potential Risk Colors scores include Low, Moderate, High, and Very High.

Analysis was performed using the Wildfire Risk dataset, and using GIS, the parcel layer was overlaid on these layers. Since it is possible for any given parcel to intersect with multiple categories for purposes of this analysis, the parcel centroid was used to determine which Wildfire Risk Area to assign to each parcel. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessor's database and the parcel layer.

Wildfire Risk Area Values at Risk

The SSN's Wildfire Risk Areas are shown in Figure 4-37. Analysis results for the SSN is summarized in Table 4-40, which summarizes by total parcel counts, improved parcel counts, and their improved and land values and the estimated contents replacement values based on the CRV factors detailed in Section .

Figure 4-37 Santee Sioux Nation – Wildfire Risk Areas

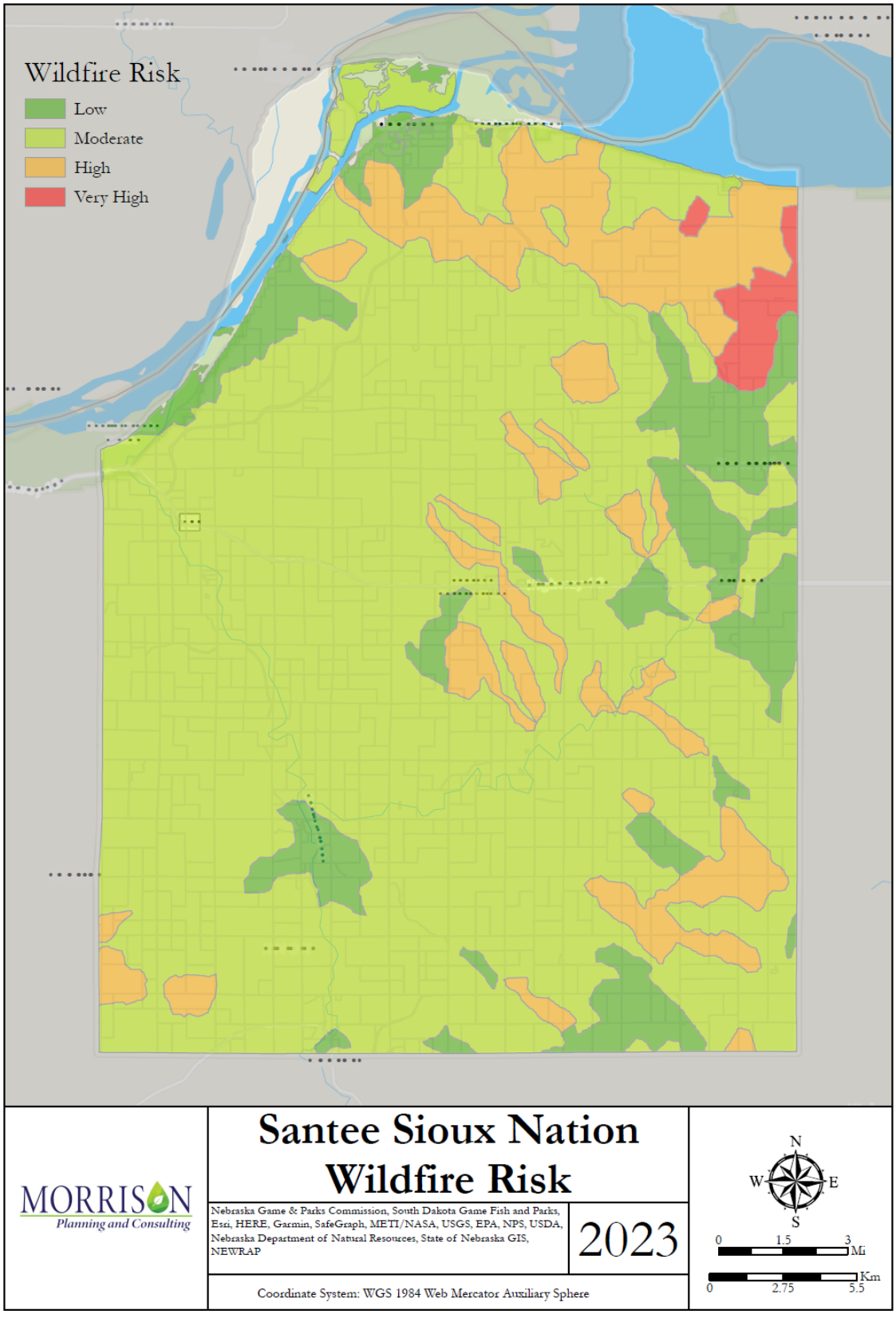


Table 4-40 Santee Sioux Nation– Summary Count and Values of Parcels by Wildfire Risk Area

Wildfire Risk Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High	20	6	$2,250,927.60	$314,075.30	$157,037.65	$2,722,040.55
High	221	33	$24,264,596.40	$992,987.40	$496,493.70	$25,754,077.50
Moderate	957	122	$142,890,716.10	$6,932,917.80	$3,466,458.90	$153,290,092.80
Low	392	94	$33,676,546.60	$3,708,888.30	$1,854,444.15	$39,239,879.05
Total	**1,590**	**255**	**$203,082,786.70**	**$11,948,868.80**	**$5,974,434.40**	**$221,006,089.90**

Source: Nebraska Department of Forestry, State of Nebraska 2022 Parcel Data

Critical Facilities at Risk

Wildfire can present a risk to the critical facilities and infrastructure in the SSN. A separate analysis was performed on the critical facility inventory in the SSN to determine critical facilities in the wildfire risk areas. Using GIS, the wildfire risk areas were overlayed on the critical facility GIS layer. Figure 4-38 shows critical facilities, as well as the wildfire risk areas. Critical facilities and the wildfire risk areas they fall in are detailed in Table 4-41.

Figure 4-38 Santee Sioux Nation – Critical Facilities in Wildfire Risk Areas

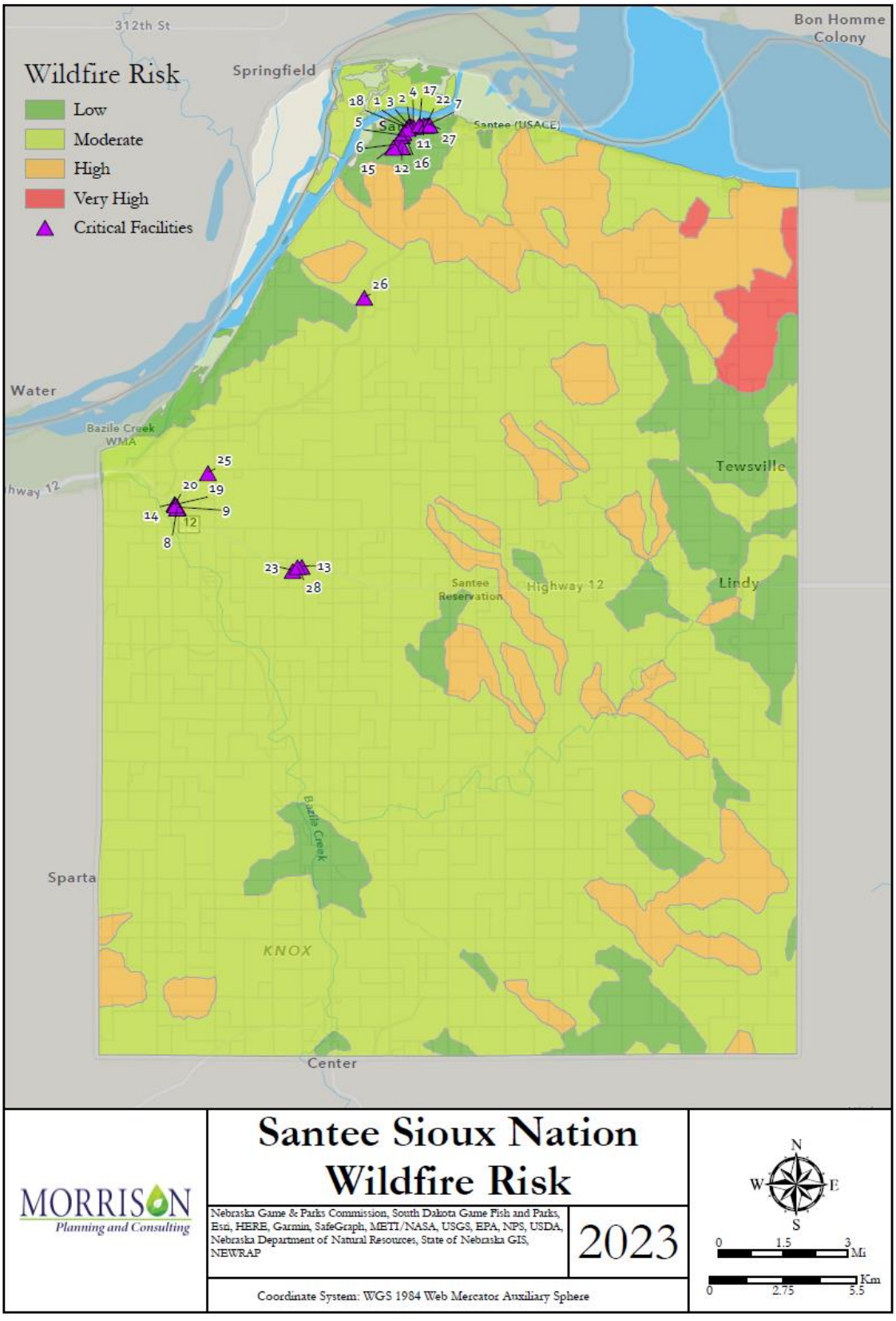


Table 4-41 Santee Sioux Nation – Critical Facilities in Wildfire Risk Areas

Location ID	Facility Name	Value	Wildfire Risk
1	Main Tribal Office	$2,867,600	Low
2	Tribal Court	$246,742	Low
3	Transfer Station	$37,343	Low
4	Utility Office	$255,409	Low
5	Day Care Center	$24,503	Low
6	Cultural Museum	$539,280	Low
7	Police Station	$348,075	Low
11	Teen Center	$219,739	Low
12	Grocery Store	$1,429,044	Low
15	Medical Clinic	$18,532,400	Low
16	Lakeview Gas & C-Store	$850,200	Low
17	Fire House	$566,030	Low
18	Domestic Violence Home	$316,292	Low
22	Community Swimming Pool	$585,054	Low
27	Santee Mini Storage	$107,214	Low
8	Land Management Office	$1,713,987	Moderate
9	Warriors Lodge/Youth Center	$251,980	Moderate
13	Feather Hill Express Station (Vacant)	$174,475	Moderate
14	Dakota Transit	$187,785	Moderate
19	Industrial Park Building (Dollar Plus)	$2,093,558	Moderate
20	Feather Hill Express Station	$3,252,050	Moderate
23	Tatanka Golf Course	$6,352,095	Moderate
25	S.T. Ranch	$656,123	Moderate
26	Kaylon's House and Shop	$314,366	Moderate
28	Ohiya Casino	$20,801,032	Moderate

Source: Nebraska Department of Forestry, SSN

Overall Community Impact

The overall impact to the SSN from a severe wildfire includes:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Decreased water quality in area watersheds;
- Increase in post-fire hazards such as flooding, sedimentation, and mudslides;
- Damage to natural resource habitats and other resources;
- Loss of water, power, roads, phones, and transportation, which could impact, strand, and/or impair mobility for emergency responders and/or area residents;
- Economic losses (jobs, sales, tax revenue) associated with loss of commercial structures;

- Negative impact on commercial and residential property values;
- Air quality can be affected (both with local fires and with fires in the area)
- Loss of churches, which could severely impact the social fabric of the community;
- Loss of schools, which could severely impact the entire school system and disrupt families and teachers, as temporary facilities and relocations would likely be needed; and
- Impact on the overall mental health of the community.

Future Development

Future SSN facilities will take wildfire into account when siting new facilities. Fire hydrants, defensible space, ignition resistant construction, well production, water storage, and on-going maintenance are all wildfire considerations when assessing future development. New facilities will be built to the most current HUD or IBC standards, which takes wildfire into account during building design and construction.

4.3.13. Natural Hazards Summary

Table 4-42 summarizes the results of the hazard identification and hazard profile for the Tribe based on the hazard identification data and input from the THMPC. For each hazard profiled in Section 4.2, this table includes the probability of future occurrence and whether the hazard is considered a priority hazard for the Tribe based on the hazard profiles and vulnerability assessment.

Priority Hazards

As detailed in the hazard identification section, those hazards identified as a high or medium significance in Table 4-42 are considered priority hazards for mitigation planning. This was done initially for the Tribe in Table 4-3. Based on the results of the risk assessment, some of these may have changed. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, crop, and economic damage. The ability of the Tribe to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. Those hazards that occur infrequently or have little or no impact on the Tribe were determined to be of low significance and not considered a priority hazard for mitigation planning purposes. This assessment was used by the THMPC to prioritize those hazards of greatest significance to the Santee Sioux Nation, enabling the Tribe to focus resources where they are most needed.

Table 4-42 Hazard Identification and Initial Determination of Priority Hazards for Mitigation Planning

Hazard	Probability of Future Occurrence	Priority Hazard
Dam Failure	Unlikely	N
Drought and Water Shortage	Likely	Y
Flood: 1%/0.2% annual chance	Unlikely	Y
Hazardous Materials: Transportation	Occasional	N
Landslide	Likely	Y
Pandemic	Occasional	N

Hazard	Probability of Future Occurrence	Priority Hazard
Severe Weather: Extreme Heat	Highly Likely	Y
Severe Weather: Heavy Rain and Storms	Highly Likely	Y
Severe Weather: High Wind and Tornado	Highly Likely	Y
Severe Weather: Winter Storms	Highly Likely	Y
Wildfire	Highly Likely	Y

Source: Santee Sioux Nation

4.4 Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the Tribe and described, in general, the vulnerability of the Tribe to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the Tribe's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this Plan.

This section presents the Tribe's mitigation capabilities and resources. These are in addition to, and supplement, the many plans, reports, and technical information reviewed and used for this THMP as identified in Chapter 3 and in Chapter 4. Similar to the THMPC's effort to describe hazards, risks, and vulnerability of the Tribe, this mitigation capability assessment describes the Tribe's existing capabilities, programs, and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This assessment is divided into four sections: regulatory mitigation capabilities are discussed in Section 4.4.1; administrative and technical mitigation capabilities are discussed in Section 4.4.2; fiscal mitigation capabilities are discussed in Section 4.4.3; and mitigation education, outreach, and partnerships are discussed in Section 4.4.4. A discussion of other mitigation efforts follows in Section 4.4.5. These capabilities are in addition to, include, and supplement the many plans, reports, and technical information reviewed and used for this THMP.

4.4.1. Santee Sioux Nation Regulatory Mitigation Capabilities

Table 4-43 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Tribe. Many of the regulatory capabilities below address hazards, projects, and can be used to implement mitigation actions.

Table 4-43 Santee Sioux Nation Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	
Community Wildfire Protection Plan	Yes	The plan addresses hazards and can be used for mitigation actions. This was updated in 2011.
Comprehensive/Master Plan	N	

Continuity of Operations Plan	N	
Economic Development Plan	N/A	
Housing Plan	Y	The housing plan is a partnership with Bureau of Indian Affairs (BIA). This plan can be used to decide where to develop, which takes hazards into account.
Local Emergency Operations Plan	Y	There is a local emergency operations plan, it is dated 2011. This plan can be used to carry out mitigation actions. It is in the process of being updated during of the writing of this THMP.
Transportation Plan	Y	There is a long-range transportation plan. It does need to be updated, however, which occurs every 10 years. It can be used to carry out mitigation planning.
Other (describe)	N	
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	
Building code	N	Housing in the SSN is built to code, but not by the codes enforced by the Tribe. The housing source (HUD, or others) has their own building codes that are used for Tribal housing.
Floodplain ordinance	N	Floodplain mapping has been completed by the state of NE, but there is nothing tribally adopted. The State renders aid during building planning.
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	This goes directly to FEMA and bypasses county and state.
Subdivision ordinance	N	
Zoning ordinance or practices	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
There are multiple plans that require updating. The EOP and the Transportation Plan specifically need an update. Revising and updating both these plans would increase the ability for the Tribe to mitigate natural hazards.		

Source: Santee Sioux Nation

4.4.2. Santee Sioux Nation Administrative/Technical Mitigation Capabilities

Table 4-44 identifies Tribal personnel responsible for activities related to mitigation and loss prevention in the Tribe.

Table 4-44 Santee Sioux Nation Administrative/Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability. Is coordination effective?
Administrative Resource		**Describe Capability Is coordination between agencies and staff effective?**
Tribal Council/Governing Body	Y	The Tribal Council is an active organization that has been working to increase their capabilities in hazard mitigation and response. The Tribal Council has effective relationships with local, state, and federal agencies and the coordination between them is effective.
Tribal Chief Executive	Y	The Tribal Chairman is responsible for and handles tribal government. The Chief Executive Officer (CEO) works directly with tribal government and coordinates, works with tribal programs their directors and employees. The CEO also assists programs with reporting, budgets, and brings these reports to tribal council and Tribal Chairman.
Mitigation Planning Committee	Y	This Mitigation Planning Committee is newly formed and has begun the process of meeting to discuss creating mitigation efforts. Within this committee there are program directors and other managerial staff from throughout the tribe.
Business Committee	N	There is no Business Committee currently, but there are plans to create one in the future.
Mutual Aid Agreements	Y	The Knox County Fire and Rescue has a mutual aid agreement with BIA firefighters.
Staff	**Y/N**	**Is this a permanent position? Is staffing adequate to enforce regulations? Are staff trained in hazards and mitigation? Is additional staff (outside resources) available to implement actions?**
Code Inspector	N	
Environmental/Natural Resources Specialist	Y	There is an EPA office which holds a permanent position. They have adequate staffing and have training on hazards and mitigation. There are outside resources available.
Emergency Manager	Y	There has been an emergency manager appointed temporarily by The Tribal Council. Currently, there's no other staff and no one within the position that has been trained in mitigation or managing hazard events. There are outside resources available.
Community Planner	N	
Housing Specialist	Y	Frank Whipple is the Housing Authority Director. He can enforce regulations within the housing authority, however, is not trained in hazards and mitigation. There are outside resources are available.
Engineer	N	There has been an engineer hired outside the tribe for different projects.

Historian/Cultural Advisor	Y	A position that's called the Historic preservation office/committee appointed by council. Yes, it can enforce regulations, although this is not a regularly paid position. There's no one appointed in this position who's trained on hazards and mitigation.
Financial or Grants Specialist	Y	This is a permanent position and staff are allowed to enforce regulations. They're not trained in hazards or mitigation; however, outside resources are available.
Administrative Staff Person	Y	The CEO monitors all tribal programs, and this is a permanent position. They are not trained on hazards and mitigation.
Other (Biologist, Public Health Specialist)	Y	There is a Public Health Director who is appointed by the Tribal Council. Staffing is adequate and the individual is trained in hazards and mitigation. There are also outside resources available.
Technical Resource		**Is staffing adequate?** **Is staff trained?**
Warning Systems/Services (Reverse 911, (Outdoor Warning Signals)	Y	There are warning sirens for dangerous storms, fire, or vehicle car crashes. This is within the community of Santee only. Tribal council notifies people on social media on upcoming dangerous storms.
Hazard Data and Information	N	
Grant Writing	Y	This is a resource the Tribe has, but it needs more staffing and more training.
GIS	N	
Other	N	

How can these capabilities be expanded and improved to reduce risk?
The Tribe needs some of the part-time positions to be full-time paid positions. The Tribe would also need additional needed funding to get some of those staff and resources. The Tribe lacks these funds to hire certain positions and money must be borrowed or paid from different tribally owned businesses. A strategic plan has the possibility of demonstrating the priorities of the Tribe that would overlap with the staff and technical resources that are mentioned in this table. There are multiple areas to be improved. An emergency manager needs to be hired and additional staff are required to build an Emergency Department. The Tribe has always operated on a reactive basis over a proactive basis, especially when a disaster or an emergency happens. This leaves the Tribe vulnerable. An emergency manager could help alleviate those concerns by planning and implementing emergency operation changes. Community planning comes from the Tribal Council or from Tribal entities appointed to develop community planning efforts. However, for those who are appointed, it is a non-paid committee member or individual. A full-time planner would help the Tribe increase community resilience and sustainability by planning for the future. There is a housing need within the Tribe and the current housing authority, and its director do work in this area. Becoming a homeowner is a dream for every Tribal member and owners are statistically less vulnerable than the houseless or those who rent. This is an area where a greater focus needs to be; emphasize getting new homes and new homeowners. The Tribe has a Tribal Historic Preservation Office and Director. This office is overseen by a board consisting of tribal elders and other individuals with knowledge of tribal history. There are mainly volunteers who complete this work with an occasional stipend for services given to members of that office. A full-time position to focus solely on historic preservation is needed. This office has the potential to be extremely beneficial to the Tribe and while volunteer work is great, the full potential of that office and what it could do cannot be realized without a full-time staff member. The need for improvements is everywhere. In the Tribes history, the plans that were created were not detailed. They merely took on business and issues as they came, reacting instead of proactively preparing and planning ahead. The Tribe and the community of Santee is small which may be a factor why planning sessions, different staff, and programs were never created. Due to the lack of severity and impact of emergencies, hazard events, and other past disasters may have played a part in a lack of mitigation and future planning efforts. The financial aspect is a big factor as well. Being underfunded and not having the capability to go after and find new funding sources.

Source: Santee Sioux Nation

4.4.3. Santee Sioux Nation Fiscal Mitigation Capabilities

Table 4-45 identifies financial tools or resources that the SSN could potentially use to help fund mitigation activities.

Table 4-45 Santee Sioux Nation Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital Improvements Project Funding	N	

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Gaming Revenue/Enterprise Revenues	Y	This funding source has been used for gaming facility upgrades such as stand by generators. The facility has also been used for tribal emergency planning meetings and has acted as a community shelter in times of severe weather and power outages. Gaming revenue and enterprise revenue can be used for mitigation actions once approved by Gaming Commission and/or the Tribal Council.
Federal Funding Programs (non-FEMA)	Y	The BIA Fire is used for removal of hazardous fuels (like cedar trees) and prescribed burning. From other tribal funds, the SSN has cut trees down around homes and parks to prevent damage from wind and storms. Within this source, other resources can be used for mitigation purposes.
Fees for Water, Sewer, gas, or Electric Services	Y	The housing authority pays utility bills for 110 low-income home units. Another 130 homes are individually owned by tribal members who pay for water and sewer to the SSN utility commission. Propane and electricity bills are paid to a company not owned by the tribe. It's possible fees for water and sewer could be used for mitigation purpose but this action would need council approval.
Fees from Festivals, Campsites, and Recreational Areas	Y	The Tribe has an RV park, but fees gathered from that are used for upkeep of that park. The annual traditional celebrations are free to the public. Regardless of this, currently those funds would not be used for mitigation.
Permits and Other Fees	Y	There are other fees such as what is used from the Tribal Historic Preservation Office (like filing fees for building permits). These funds are used to help provide income for that office. The Tribe's Tax Commission does collect from local tribally owned businesses and these dollars can be used for mitigation purposes. In the past, these funds have been used to fix roads and purchase emergency/rescue equipment. If the fees were to be used for mitigation actions, the Tax Commission would need to approve.

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Federal Funding (BIA, HUD)	Y	The BIA Wildland Fire has used funds for hazardous fuel reduction. Land Management has used 638 funding, which helps repair roads, clear snow and install traffic signs when needed. Both programs could be used for some mitigation purposes.
Contract Services	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Directors and managers can write mitigation efforts in their budgets, scope of work, or propose plans to tribal leadership on how funds from these sources can be used for mitigation, future plans, and other projects that would assist the tribe. Having these dollars allocated to a specific fund could help with ensuring integrity and proper use of these funds. The Tax Commission is a viable option now as well for the Tribe to pull funds for mitigation actions (with Commission and Council approval). It will set a precedent that planning ahead is a need to help benefit the long-term health of the Tribe.		

Source: Santee Sioux Nation

4.4.4. Santee Sioux Nation Mitigation Education, Outreach, and Partnerships

Table 4-46 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table 4-46 Santee Sioux Nation Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Gatherings, Festivals, Celebrations, and/or Meetings	Y	There are cultural celebrations 3 times a year that are called a Wacipi (pow-wow). Vendors and other booths are set up for various lengths of time, from a single day to multiple days. This is a space where education can occur and face-to-face discussions can be done with many people. The importance of mitigation efforts can be explained. There are also various committee meetings throughout the tribe. The Housing Authority has a board of directors, the Ohiya Casino has the Gaming Commission, and there are 4 districts that make up the reservation; each district has a committee. These are just a few examples, but these committees can help disseminate mitigation education and help to create partnerships with different tribal entities.

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Natural Disaster or Safety-Related School Program	N	There are currently no active programs or organizations. The school has indicated there is a need to have more safety, mitigation, and emergency plans.
Fire Safety Programs	Y	The BIA wildland fire will go into the younger grades of school with Smokey The Bear and discuss preventing wildfires. The volunteer fire department will bring their fire truck to head start and elementary and explain fire safety.
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
Educational efforts on mitigation could be done at our local celebrations, health fairs, and during presentations for committee meetings. There are partnerships with community schools and colleges that could help spread knowledge to younger people on the importance of mitigation. Along with this, partnerships with neighboring tribes, communities, and other emergency management agencies would help the tribe with ideas on educational safety programs and mitigation actions.		

Source: Santee Sioux Nation

4.4.5. Other Mitigation Efforts

The next sections detail those mitigation efforts the SSN pursues that haven't been previously discussed in the tables above. This includes:

- The Tribe continues to seek to learn about hazard mitigation and is seeking partners (both public and private) to reduce risk to the SSN and its residents.
- The Santee Health Center has done a Hazard Vulnerability Analysis for their facilities. It looked at natural hazards. This THMP and the HVA for the Santee Health Center have many areas of overlap, and it is an area for future partnerships in mitigation.

Chapter 5 Mitigation Strategy

Requirement §201.7(c)(3) and §201.7(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for this Santee Sioux Nation Tribal Hazard Mitigation Plan (THMP). It describes how the Tribe met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the Tribal Hazard Mitigation Planning Committee (THMPC) led to the mitigation strategy and mitigation action plan for this THMP. The THMPC developed the following umbrella mitigation strategy for this THMP:

- Communicate the hazard information collected and analyzed through this planning process as well as mitigation success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Implement the action plan recommendations of this Plan.
- Use existing rules, regulations, policies, and procedures already in existence.
- Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged, and broader constituent support may be garnered.

5.1.1. Continued Compliance with NFIP

To participate in the National Flood Insurance Program (NFIP), a community must adopt and enforce floodplain management regulations that meet or exceed the minimum requirements of the Program. These requirements are intended to prevent loss of life and property and to reduce taxpayer's costs for disaster relief as well as minimize economic and social hardships that result from flooding. Participation in the NFIP provides a community with access to flood insurance.

The SSN does not currently participate in the NFIP. During the creation of this THMP, the Tribe decided to research joining the NFIP. It is included as a mitigation action in Section 5.4.

5.1.2. Integration of Mitigation with Post Disaster Recovery and Mitigation Strategy Funding Opportunities

Hazard mitigation actions are essential to weaving long-term resiliency into all SSN recovery efforts so that at-risk infrastructure, development, and other SSN assets are stronger and more resilient for the next severe storm event. Mitigation measures to reduce the risk and vulnerability of a community to future disaster losses can be implemented in advance of a disaster event and also as part of post-disaster recovery efforts.

Mitigation applied to recovery helps jurisdictions become more resilient and sustainable. It is often most efficient to fund all eligible infrastructure mitigation through FEMA's Public Assistance mitigation program if the asset was damaged in a storm or other hazard event. Mitigation work can be added to project worksheets if they can be proven to be cost-beneficial. Integration of mitigation into post disaster recovery efforts should be considered as part of post disaster redevelopment and mitigation policies and procedures.

The SSN's Emergency Operations Plan (EOP), through its policies and procedures, seek to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return the SSN to its normal state of affairs. Mitigation is emphasized as a major component of recovery efforts.

Mitigation Strategy Funding Opportunities

An understanding of the various funding streams and opportunities will enable the SSN to match identified mitigation projects with the grant programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. Mitigation grant pre- and post-funding opportunities include the following.

FEMA Hazard Mitigation Assistance (HMA) Grants

FEMA administers four main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Pre-Disaster Mitigation Program, (3) Flood Mitigation Assistance Program, and (4) Building Resilient Infrastructure and Communities. Eligible applicants for the HMA include state and local governments, certain private non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant.

FEMA Public Assistance Section 406 Mitigation

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events.

Small Business Loans

SBA offers low-interest, fixed-rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help

them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.

5.2 Goals and Objectives

Requirement §201.7(c)(3)(i) and §201.7(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The THMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section. Appendix C documents the information covered in these mitigation strategy meetings, including information on the goals development and the identification and prioritization of mitigation alternatives by the THMPC.

During the initial goal-setting meeting, the THMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the Santee Sioux Nation.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- A time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

THMPC members were provided with a list of sample goals to consider. The team was told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was asked to provide two goal statements. Goal statements were collected and grouped into similar themes and provided to the THMPC. Next, the THMPC developed objectives that summarized strategies to achieve each goal. Edits and refinements to these new goals and resulting objectives were provided by the HMPC until the team came to consensus on the final goals and objectives for this 2023 THMP.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals, which provide the direction for reducing future hazard-related losses within the Santee Sioux Nation.

- Goal 1: Protect Health and Safety of Residents
- Goal 2: Reduce Future Losses from Hazard Events

- Goal 3: Increase Public Awareness and Education on Vulnerability to Hazards
- Goal 4: Improve Emergency Management Capabilities

5.3 Identification and Analysis of Mitigation Actions

Requirement §201.7(c)(3)(ii) and §201.7(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated at the completion of the risk assessment as part of the second prioritization process to determine which hazards were priorities for mitigation strategy planning. Only those hazards that were determined to be a priority hazard for each participating jurisdiction were considered further in the development of hazard-specific mitigation actions. Those hazards not considered a priority for mitigation strategy development were eliminated from further consideration because the risk of a hazard event in the Tribe is unlikely, the vulnerability of the Tribe is low, or capabilities are already in place to mitigate negative impacts. Further, the resulting mitigation strategy presented in this Chapter focuses on those mitigation actions that each jurisdiction has the authority, resources, and capacity to consider for implementation over the next 5-years covered by this THMP.

These priority hazards (in alphabetical order) are:

- Drought & Water Shortage
- Flood: 1%/0.2% annual chance
- Landslide
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Wind and Tornado
- Weather: Winter Storms
- Wildfire

The THMPC eliminated the hazards identified below from further consideration in the development of mitigation actions because the risk of a hazard event in the SSN is unlikely or nonexistent, the vulnerability of the Tribe is low, capabilities are already in place to mitigate negative impacts, or the Tribe does not have the authority or control over mitigation of the hazard. The eliminated hazards are:

- Dam Failure
- Hazardous Materials Transportation Release
- Pandemic

It is important to note, however, that all the Hazards addressed in this Plan are included in the multi-hazard public awareness mitigation action as well as in other multi-hazard actions.

Once it was determined which hazards warranted the development of specific mitigation actions, the THMPC analyzed viable mitigation options that supported the identified goals and objectives. The THMPC

was provided with the following list of categories of mitigation actions, which originate from the Community Rating System:

- Prevention
- Property protection
- Structural projects
- Natural resource protection
- Emergency services
- Public information

The THMPC was provided with examples of potential mitigation actions for each of the above categories. The THMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix C provides a detailed review and discussion of the six mitigation categories to assist in the review and identification of possible mitigation activities or projects. Also utilized in the review of possible mitigation measures is FEMA's publication on Mitigation Ideas, by hazard type. Prevention type mitigation alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.

5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

With these criteria in mind, HMPC members were each provided with nine weighted votes, indicating High (worth 5 points), Medium (worth 3 points), and Low (worth 1 point) priorities. The team was asked to use

the votes to prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the THMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.4 The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this THMP.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the THMPC decided to pursue actions that contributed to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized mitigation action plan for the Tribe.

5.4 Mitigation Action Plan

Requirement §201.7(c)(3)(iii) and §201.7(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This mitigation action plan was developed to present the recommendations developed by the THMPC for how the Tribe can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. This mitigation action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-1 identifies all mitigation actions for all participating jurisdictions to this THMP. For each mitigation action item included in Table 5-1, a detailed mitigation implementation strategy has been developed. As described throughout this THMP, the Tribe has many risks and vulnerabilities to identified hazards. Although many possible mitigation actions, as detailed in Appendix C, were brainstormed and prioritized during the mitigation strategy meetings, the resulting mitigation strategy presented in this Chapter 5 of this THMP focuses only on those mitigation actions that are both reasonable and realistic for the community to consider for implementation over the next 5-years covered by this 2023 THMP. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-1. Although many good ideas were developed during the mitigation action brainstorming process, the reality of determining which priority actions to develop and include in this

THMP came down to the actual priorities of communities, individuals and departments based in part on department direction, staffing, and available funding. The overall value of the mitigation action table in Appendix C is that it represents a wide-range of mitigation actions that can be consulted and developed for this THMP during annual plan reviews and the formal 5-year update process.

It is also important to note that the Tribe has numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as the EOP and the Community Wildfire Protection Plan (CWPP). These actions are considered to be part of this Plan, and the details, to avoid duplication, should be referenced in their original source document. The THMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this Plan.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The participating communities are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the community to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the mitigation categories and criteria contained in Appendix C.

Table 5-1 Santee Sioux Nation Planning Area Mitigation

Action Title	Address Current Development	Address Future Development	Mitigation Type
Multi-Hazard Actions			
Public outreach and education (for natural hazards)	X	X	Public Information
Public Outreach and Education (for Public Health Emergencies)	X	X	Public Information
Hire Emergency Manager (Complete management plan)	X	X	Emergency Services
Mass Notifications	X	X	Emergency Services Public Information
Identify Vulnerable Populations	X	X	Emergency Services
Create GIS database	X	X	Emergency Services
3 Phase Tie Line from Niobrara to Santee	X	X	Structural
Early Warning Systems	X	X	Emergency Services Structural
Update EOP	X	X	Emergency Services Public Information
Safe Rooms and Shelters	X	X	Public Information Structural
Explore Relationships with Other Mitigation Partners	X	X	Emergency Services Public Information
Explore Green Energy Plan/Alternatives	X	X	Property Protection Natural Resource Protection

Action Title	Address Current Development	Address Future Development	Mitigation Type
Undergrounding Utilities	X	X	Structural
Resilient Housing Stock	X	X	Structural
Drought and Water Shortage Actions			
Continue Monitoring Wells	X	X	Natural Resource Protection
Water System	X	X	Structural
Drought Planning			Property Protection Natural Resource Protection
Flood Actions			
Update Flood Management Plan	X	X	Property Protection Natural Resource Protection
Explore NFIP	X	X	Prevention
Culvert Cleaning	X	X	Property Protection Natural Resource Protection
Landslide Actions			
Protect Water Lines from Future Landslides			Property Protection
Severe Weather Actions			
Generator Backups	X	X	Emergency Services Property Protection
Explore Areas for Cooling Centers	X	X	Emergency Services
Wildfire			
Seek to Complete Actions in the Most Recent Fire Plan	X	X	Property Protection Natural Resource Protection

Multi-Hazard Actions

Action 1. Public Outreach and Education (for Natural Hazards)

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: The Tribe plays a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The Tribe will work with other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk

and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, will include elements to meet the objectives of Goal 3 of this THMP, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, websites, and public service announcements;
- Displaying public outreach information in SSN buildings, schools, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place (which are minimal).

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing Tribal outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: Santee Sioux Nation Emergency Manager

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation.

Benefits (Losses Avoided): Increase Tribal members knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public education and awareness campaign

Priority (H, M, L): High

Action 2. Public Outreach and Education (for Public Health Emergencies)

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: Public Health Emergency: The health department's primary focus is dealing with public health emergencies, and the most significant event in recent times that impacted the district is the COVID-19 pandemic. This pandemic had far-reaching consequences in the region, presenting numerous challenges that required active response and mitigation. Within the nine-county region, the North Central District Health Department played a crucial role as the primary source of information and tracking for COVID-19. During the pandemic the department provided essential services such as COVID-19 testing,

vaccinations, dissemination of public health guidelines, and making available various informational resources related to the virus.

Project Description: The health department has conducted a vulnerability analysis reviewing both natural and manmade hazards. As a result, public health emergencies and other mass casualty events were rated highly in terms of their risk to the department. To enhance their capabilities, the health department regularly updates their emergency response plan. These updates enable the health department to better respond to and mitigate risks more efficiently.

In response to public health emergencies and other mass casualty events which could occur within the Santee Sioux Nation the North Central District Health Department is exploring options to provide supplies for an emergency shelter unit since there are limited roadways into the area and access could be hindered during a disaster.

Other Alternatives: Continue public information activities currently in place (which are minimal).

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing Tribal outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: North Central District Health Department/ Santee Sioux Nation Health Center

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation. Costs are thought to be relatively minor ($500+)

Benefits (Losses Avoided): Increase Tribal members knowledge of potential public health hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public education and awareness campaign

Priority (H, M, L): Medium

Action 3. Hire Emergency Manager (Complete Management Plan)

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: Being able to respond quickly and appropriately during an emergency is an important part of running any organization. An emergency management director is someone who professionally plans for disasters, accidents and other emergency scenarios.

Project Description: The SSN desires to hire an Emergency Manager who would spearhead a complete Emergency Management Plan for the SSN. The Emergency Manager would also be tasked with seeking grant funds for the Tribe for mitigation actions. The Emergency Manger would also be tasked with completing a SSN Emergency Management Plan.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Tribal Council.

Responsible Office/Partners: Tribal Council.

Cost Estimate: The cost estimate varies, but is thought to be $40,000 to $60,000 per year for a full time emergency manager.

Benefits (Losses Avoided): An emergency manager would help the SSN prepare for, respond to, and recover from natural disasters. This reduces risk to both people and property on SSN lands.

Potential Funding: BIA grants. FEMA EMPG grants. Other FEMA grant sources.

Timeline: As soon as funding is available. It is the goal to have someone within a year if possible.

Project Priority (H, M, L): High

Action 4. Mass Notifications

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: During the 2019 flooding, many of SSN residents didn't know the event was happening due to the only notification being through the SSN Facebook page. With a varied age population and locations of members being spread out across the Tribe, only having one form of notification system is problematic. The Tribe needs a method of communicating with all of its members quickly, especially during hazard events.

Project Description: The SSN will consider multiple avenues for mass notification:

- Implement Reverse 911 system.
- Use the existing siren system
- Create a SSN Twitter page that can be used to update the tribal members.
- Sign up and participate in the CodeRED system.
- Utilize ZoneHaven for emergency evacuation notifications.

Each of these options will be researched to find a proper fit for the Tribe.

Other Alternatives: Continue existing limited notification system.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Tribal Council

Responsible Office/Partners: Tribal Council, Tribal Emergency Manager (to be hired)

Cost Estimate: Varies depending on options chosen.

Benefits (Losses Avoided): Increased life safety as members have additional time to prepare for hazard events.

Potential Funding: BIA and FEMA grants.

Timeline: Within 5 years.

Project Priority (H, M, L):

Action 5. Identify Vulnerable Populations

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: Certain populations are at greater risk to natural hazards. This includes those under the age of 5, those over the age of 65, economically disadvantaged individuals, those on medical equipment, and those with underlying health issues, among others. Many SSN members fall under these categories. These groups need additional help during times of natural disasters.

Project Description: In order to understand who is at greater risk, the SSN is looking to create a list of those who need additional assistance. Once this list is generated, strategies on how to assist these individuals will be reviewed and analyzed.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This THMP. EOP. Fire Plans.

Responsible Office/Partners: Tribal Council. Emergency Manager (to be hired)

Cost Estimate: Staff time.

Benefits (Losses Avoided): Reduced risk to socially vulnerable individuals in the SSN.

Potential Funding: Existing budgets. BIA grants. FEMA grants.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 6. Create GIS Database

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: A Geographic Information System (GIS) is a computer system that analyzes and displays geographically referenced information. It uses data that is attached to a unique location. This data can be used to prepare for and respond to hazards and disasters.

Project Description: The Tribe will partner with the BIA and a consultant to create a geodatabase with tribal lands and structures. The Branch of Geospatial Support (BOGS) is the technical support office to Indian Affairs (IA) and all federally-recognized Tribes for geographic information systems (GIS) as a part of the Department of the Interior, Bureau of Indian Affairs (BIA) Esri Enterprise License Agreement. The BIA has a GIS dataset that will be built upon. Data attributes will be added that assist the SSN in emergency management. This may include structure values, vulnerable populations, and other items the SSN sees fit to add. Training for SSN staff will be sought as well in order to maintain the database.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: IT Department.

Responsible Office/Partners: Tribal emergency manager (when hired). BIA BOGS.

Cost Estimate: Estimated to be $7,500 to $20,000.

Benefits (Losses Avoided): Increased ability to prepare for disasters. Increased ability to secure FEMA grants that require Benefit Cost Analysis.

Potential Funding: BIA and FEMA grants.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 7. 3 Phase Tie Line from Niobrara to Santee

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: During the 2019 flooding, power was out to the SSN for 48 hours. A large diesel generator was brought in at great cost to provide power. This project seek to create power redundancy by bringing in a second line to supply power to the SSN.

Project Description: This project will bring a 3 phase line from Niobrara to Santee. This will be built to more modern standards using poles closer together and a twisted wire design. This includes an Archeological Survey. This is done in two phases, the first phase will consist of reviewing all data related to the line route via "desktop" research. The initial research will determine if a site survey (phase two) needs to be completed. A site survey includes obtaining ground samples and visual indications of possible archeological significance. Once the survey is completed, work can begin in earnest.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: NCPPD LHMP

Responsible Office/Partners: Tribal Council and NCPPD

Cost Estimate: Estimated to be $1.2 million.

Benefits (Losses Avoided): Reduced risk to SSN members during natural hazards. This is especially true during periods of extreme cold and freeze periods

Potential Funding: BIA and FEMA grants.

Timeline: Within 5 years.

Project Priority (H, M, L): High

Action 8. Update EOP

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: The Tribe currently has an EOP from 2019. This Plan was completed after the flooding of 2019. The Plan is in need of an update.

Project Description: Update and make EOP more thorough. Align with Knox County EOP, but tailor the document to more closely meet the needs of the SSN.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The EOP is the planning mechanism.

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired)

Cost Estimate: $30,000

Benefits (Losses Avoided): Reduced risk to people and property, as the SSN will be better able to respond to any future natural disaster.

Potential Funding: FEMA grants, as well as other grant funding sources.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 9. Safe Rooms and Shelters

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Hazardous Materials, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: The SSN sees many natural and man-made hazards that can cause evacuations or causing people to seek shelter before, during, and after an event.

Project Description: The SSN has many areas that could serve as safe rooms or shelters. This project will seek to find which areas work best, and then seek to figure out the logistics of opening and staffing a shelter at that chosen location. Public education would be needed to inform SSN members about where shelters are, and when they are open.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired)

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk to injuries and deaths.

Potential Funding: IHS, FEMA, BIA, and other grant funds.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 10. Explore Relationships with Other Mitigation Partners

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Hazardous Materials, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: The Tribe is at risk to many hazards. These hazard risks do not stop at SSN boundaries. Many other area governments and agencies that border the SSN face the same hazards.

Project Description: The SSN is seeking to partner with other local organizations, agencies, and governments in order to better prepare and mitigate the causes and effects of natural hazards. This includes partnerships with Knox County, the State of Nebraska, EPA, IHS, BIA. It also includes organizations like the Missouri Sedimentation Action Coalition.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired). EPA.

Cost Estimate: Staff time.

Benefits (Losses Avoided):

Potential Funding: Existing budgets.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 11. Explore Green Energy Plan/Alternatives

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: Climate change is thought to exacerbate the natural hazards the Tribe is facing.

Project Description: The Tribe is seeking to research and put together a green energy plan for the SSN.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired)

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk to the SSN members and property from natural hazards.

Potential Funding: EPA, BIA, and FEMA grant funding.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 12. Undergrounding Utilities

Hazards Addressed: Multi-hazard (Drought and Water Shortage, Flood: 1%/0.2% annual chance, Hazardous Materials, Landslide, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms, Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: The SSN depends on reliable electricity. In 2019, many poles that hold the electric lines feeding the SSN snapped, causing power outages. Power loss during periods of flooding can cause sump pump failure in homes in the SSN.

Project Description: Power poles have a limited lifespan. The District will work with the North Central Public Power Company to possibly hasten the changeover of above ground power lines to buried power lines.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: Tribal Council in coordination with the North Central Public Power Company.

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk of power loss during natural hazard events.

Potential Funding: Grant sources will be researched and sought.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 13. Resilient Housing Stock

Hazards Addressed: Multi-hazard (Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms)

Goals Addressed: 1, 2, 3, 4

Issue/Background: The Santee Sioux Nation has a stock of homes that have been built over a long period of time. Some of these homes were built to codes that are currently outdated. In addition, the housing stock is too low for many Tribal members to be able to move back onto Santee Sioux Nation lands.

Project Description: The Santee Sioux Nation would like to pursue replacing and adding additional housing stock built to modern building standards (such as wind resistance and snow load) to better serve

current Tribal members who live on the Reservation, as well as for those who currently live off Reservation but have a desire to return.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Housing Plan.

Responsible Office/Partners: Tribal Council in coordination with BIA, HUD, and other partners.

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk to members of the SSN from natural hazards.

Potential Funding: BIA, FEMA, HUD and other grant sources.

Timeline: Ongoing - -but desire to start as soon as funding is available.

Project Priority (H, M, L): Hight

Drought and Water Shortage Actions

Action 14. Continue Monitoring Wells

Hazards Addressed: Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4

Issue/Background: The U.S. Environmental Protection Agency (EPA) Region 7 has primary responsibility for overseeing implementation of the Safe Drinking Water Act (SDWA) within Indian country. Reservation water supplies are drawn almost entirely from the Bazile Creek well field near the western boundary of the Reservation. In April of 2020, the Santee Sioux Tribe of Nebraska learned that the two wells that supply the Tribe's public water system (PWS or System) had elevated levels of manganese. In response, the Tribe issued a public notification sharing this information with its PWS consumers, particularly for those with infants younger than 6 months old.

Project Description: As owner and operator of the Tribe's System, the Santee Sioux Tribe of Nebraska is responsible for the daily operation and maintenance of the water treatment plant, conducting monitoring, providing public notice and delivering drinking water to its customers that complies with the National Primary Drinking Water Regulations (NPDWR) set forth in 40 C.F.R. Part 141 and is protective of human health. In addition to the actions related to manganese addressed by this letter, the Tribe remains responsible for operating its System in compliance with the SDWA and complying with all NPDWR requirements.

Due to the elevated levels of Mn in the system, the current interim measures (providing alternate water, Mn monitoring, public education, etc.) as established in the 2021 Manganese Action Plan should continue until the long-term actions are completed and Mn levels are reduced below HA Levels. In accordance with Action Plan, the Indian Health Services, the EPA, and the Tribe continue to coordinate and communicate regularly regarding the status of the long-term corrective actions.

The SSN will continue to work with the EPA to ensure that drinking water is safe. This is a temporary mitigation measure until a longer term solution can be found.

Other Alternatives: There are six other alternatives to well water including, installing a well field in the SE corner of the Reservation, two surface water treatment plants at Bazile Creek and the Missouri River, expanding the existing well system with new wells, and two new distributions systems that connect to the Cedar-Knox Rural Water System and the West Knox Rural Water System.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing 2021 Manganese Action Plan.

Responsible Office/Partners: US EPA, SSN Utilities.

Cost Estimate: Staff time.

Benefits (Losses Avoided): Monitoring lets the SSN know when manganese levels are too high. This action seeks to avoid health complications for members of the SSN, especially the very young.

Potential Funding: Existing budget.

Timeline: Ongoing.

Project Priority (H, M, L): High

Action 15. Water System

Hazards Addressed: Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4

Issue/Background: Manganese has been found in the SSN wells. A different source of water is being sought.

Project Description: A trunk line to provide the SSN with drinking water from Fort Randall is being pursued. The Randall Community Water District would provide treated water to the Tribe through this line. This would reduce the SSN's dependence on the wells that currently are at risk from being tainted with manganese.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: Department of Utilities (in coordination with the Randall Community Water District and Clint Powell Consulting).

Cost Estimate: To be determined. In early stages of development. Thought to be $30 to $40 million.

Benefits (Losses Avoided): Reduced risk to disease from drinking water with manganese. This is especially important for children.

Potential Funding: EPA, IHS, BIA, and FEMA grant funding.

Timeline: 3-10 years.

Project Priority (H, M, L): High

Action 16. Drought Planning

Hazards Addressed: Drought and Water Shortage, Wildfire

Goals Addressed: 1, 2, 3, 4

Issue/Background: Droughts can have an effect on the SSN. Drought can affect livestock and ag production on SSN lands. Drought can also affect the wildfire risk. Additionally, drought can cause greater impacts of manganese in the water system.

Project Description: The SSN is currently working with a planning group from Arizona on an SSN Drought Plan. That Plan is currently underway. Once complete, the recommended actions from that Plan will be pursued by the SSN.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This project will create the planning mechanism.

Responsible Office/Partners: Dept. of Utilities in coordination with the Intertribal Council of Arizona.

Cost Estimate: A grant has covered the cost of planning. Each action item in the Drought Plan will have an associated cost.

Benefits (Losses Avoided): Reduced risk to SSN members and their property. Reduced risk to SSN property.

Potential Funding: Actions in the drought plan will seek funding through BIA, IHS, FEMA, State of Nebraska, and other grant sources.

Timeline: Plan should be completed in 1 to 2 years. Actions in the Drought Plan will take more time to complete.

Project Priority (H, M, L): Medium

Flood Actions

Action 17. Update Flood Management Plan

Hazards Addressed: Flood: 1% and 0.2% Annual Chance

Goals Addressed: 1, 2, 3, 4

Issue/Background: The Santee Sioux Nation has a flood management plan. The plan is outdated and not comprehensive.

Project Description: The SSN is seeking to update its flood management plan. The recent floods have made this a greater priority.

Other Alternatives: Continue to use outdated plan.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Flood management plan.

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired)

Cost Estimate: $40,000-$80,000 is the rough estimate to update the plan.

Benefits (Losses Avoided): Reduced risk to flood throughout the SSN lands. This benefits both people and property, as well as critical facilities and cultural and natural resources.

Potential Funding: BIA and FEMA grant funding,

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 18. Explore NFIP

Hazards Addressed: Flood: 1% and 0.2% Annual Chance

Goals Addressed: 1, 2, 3, 4

Issue/Background: Participation in the National Flood Insurance Program (NFIP) is voluntary. To join, the community must:

- Complete an application;
- Adopt a resolution of intent to participate and cooperate with FEMA;
- Adopt and submit a floodplain management ordinance that meets or exceeds the minimum NFIP criteria. The floodplain management ordinance must also adopt any FIRM or FHBM for the community.

Within participating communities, the Federal government makes flood insurance available throughout the community.

Project Description: The SSN does not currently participate in the NFIP. This is not uncommon. As of 2014, only 42 tribes participated in NFIP. The SSN is seeking to research the benefits of joining the NFIP. Tribal governments are showing increasing interest in National Flood Insurance Program (NFIP) participation. Tribal communities may want to participate in the NFIP because:

- Floodplain mapping allows for planning, so people can be moved out of harm's way if flooding is imminent.
- The NFIP offers flood insurance coverage for structures and contents that does not follow claims with fee increases or dropped policies.
- Potential developers may want to insure projects on reservations, but insurance is not available without participation in the NFIP and floodplain management.
- Tribes gain more control over State and Federal construction projects that would alter water flows.
- In most cases, flood insurance will reimburse more money than disaster relief programs can provide.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: No existing mechanism.

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired)

Cost Estimate: Staff time

Benefits (Losses Avoided): Reduced risk to financial losses from flooding.

Potential Funding: Existing budgets.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 19. Culvert Cleaning

Hazards Addressed: Flood, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4

Issue/Background: There are known areas where drainage culverts become clogged. This happens for a variety of reasons. There can be sticks, branches, leaves and other naturally occurring objects that clog culverts. However, there are areas where human caused issues (trash, balls, litter, and gravel runoff) can cause culverts to not work to full capacity.

Project Description: This project will seek to continue existing programs for naturally occurring objects and do a measure of public education for those human caused issues.

Other Alternatives: Installing larger culverts.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: Utilities Department.

Cost Estimate: Staff time.

Benefits (Losses Avoided): Reduced risk to properties adjacent to the localized flood areas.

Potential Funding: Existing budgets

Timeline: Ongoing

Project Priority (H, M, L): Medium

Landslide Actions

Action 20. Protect Water Lines from Future Landslides

Hazards Addressed: Landslide

Goals Addressed: 1, 2, 3, 4

Issue/Background: There are water lines that supply water to the Village of Santee that are placed along the Lindy Road. This is one of the 2 ingress/egress routes for the Village. The Lindy Road is a wide gravel road. In certain areas, there are known landslides. These landslides could occur where the water lines are buried. If this happened, the Village of Santee would be without water.

Project Description: The tribe is seeking to protect these water lines. This may take various forms depending on the location of the potential landslide. In some areas, landslide mitigation may be needed. In other areas, the lines may be need to be moved. This will vary on a case by case basis.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: No existing planning mechanism is currently in place.

Responsible Office/Partners: Tribal Utilities and Land Management

Cost Estimate: Varies based on type of mitigation efforts pursued.

Benefits (Losses Avoided): Reduced risk to loss of water in the Village of Santee.

Potential Funding: BIA grants and FEMA grants.

Timeline: The project will be started when funding is available. This project may have portions done in the next 5 years, while other portions may take longer.

Project Priority (H, M, L): High

Severe Weather Actions

Action 21. Generator Backups

Hazards Addressed: Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms, Severe Weather: High Wind and Tornado, Severe Weather: Winter Storms (as well as Flood: 1%/0.2% annual chance, Landslide, and Wildfire)

Goals Addressed: 1, 2, 3, 4

Issue/Background: Generators are emergency equipment that provide a secondary source of power. Generators and related equipment (e.g., hook-ups) are eligible under the HMGP and PDM provided that they are cost-effective, contribute to a long-term solution to the problem they are intended to address, and meet other program eligibility criteria.

Project Description: The Santee Sioux Nation is seeking generator backups for all critical facilities in the SSN.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Operations Plan.

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired)

Cost Estimate: Varies by location and backup needs. Can be $15,000 to $75,000 per site.

Benefits (Losses Avoided): Reduced risk to life safety as critical facilities stay open. This is especially true during times of natural disasters.

Potential Funding: FEMA has multiple grant programs that fund requests for generators, varying types and sizes, including, but not limited to, gasoline, diesel, propane, natural gas, alternator, and gas turbine powered devices. Applicants are able to select the program that best fits their needs and submit a request for funding. Some applicable FEMA-related grants programs include the Emergency Management Performance Grant Program, Homeland Security Grant Program, Port Security Grant Program, State Homeland Security Grant Program, and Urban Areas Security Initiative Program.

Timeline: Within 5 years (though it depends on funding availability).

Project Priority (H, M, L):

Action 22. Explore Areas for Cooling Centers

Hazards Addressed: Severe Heat

Goals Addressed: 1, 2, 3, 4

Issue/Background: Many SSN residents have limited air conditioning in their homes. During periods of extreme heat and humidity (as seen in summer of 2023), these limited air conditioning systems can struggle to keep up.

Project Description: There are areas in the SSN that could host a cooling center. Many possibilities exist. A location needs to be chosen, and then a public education campaign needs to be created to ensure that SSN residents know of the location and when it is open.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: EOP (once updated).

Responsible Office/Partners: Tribal Council and Emergency Manager (to be hired)

Cost Estimate: To be determined once a location is chosen.

Benefits (Losses Avoided): Reduced risk to people, especially those vulnerable populations at greater risk to extreme heat.

Potential Funding: BIA, HIS, FEMA grant funding. SSN budgets.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Wildfire

Action 23. Seek to Complete Actions in the Most Recent Fire Plan

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4

Issue/Background: To fulfill the Bureau of Indian Affairs (BIA) mission, it acknowledges Indian Country lands are not public property. The land is the source of a Tribe's spiritual, cultural, emotional and economical sustenance which they and their future generations depend upon for their survival. In support of the mission, the Division of Wildland Fire Management (DWFM) provides wildland fire protection and ecosystem improvement to federal trust lands held in trust for federally-recognized Tribes and individual Indians. The DWFM's support is implemented through direct services, cooperative agreements, self-determination and self-governance, where applicable. The BIA cooperates with other federal, state, county, local government, and Tribal governments to ensure the success of wildland fire management for BIA federal trust lands, providing interagency wildland fire assistance, and assisting with federally-declared disasters through emergency support functions.

Project Description: In order to reduce the risk to wildfire in the SSN, the BIA puts together fire plans. The most recent Fire Plan is currently under revision (late 2023) and will be completed after the completion of this THMPC. The Fire Plan contains multiple actions that will reduce the risk to people and property in the SSN. The SSN will seek to complete the actions in the Fire Plan.

Other Alternatives: Continue to use the existing Fire Plan.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2023 Fire Plan.

Responsible Office/Partners: SSN along with the BIA.

Cost Estimate: Varies by action.

Benefits (Losses Avoided): Reduced risk to people (increased life safety) and property on the SSN.

Potential Funding: BIA grants, FEMA grants.

Timeline: Varies, but most within 5 years.

Project Priority (H, M, L): High

Chapter 6 Plan Adoption

Requirement §201.7(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this 2023 THMP Update is to secure buy-in from the Santee Sioux Nation, raise awareness of the Plan, and formalize the Plan's approval and implementation. The adoption of this Tribal Hazard Mitigation Plan (LHMP) completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. The Tribal Council has adopted this 2023 THMP by passing a resolution. A copy of the generic resolution is included in Appendix D: Adoption Resolution.

The SSN tribal government will comply with all applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding including 2 CFR Parts 200 and 3002. The tribal government will amend this THMP whenever necessary to reflect changes in tribal or federal laws and statutes.

Chapter 7 Plan Implementation and Maintenance

Requirement §201.7(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of this 2023 THMP is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the Plan. The chapter also discusses incorporating the Plan into existing planning mechanisms and how to address continued public involvement.

7.1 Implementation

Once adopted, this Plan faces the truest test of its worth: implementation. While this Plan contains many worthwhile actions, the Santee Sioux Nation will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful Plan implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms, such as stormwater plans, Emergency Operations Plans (EOPs), evacuation plans, and other hazard and emergency management planning efforts for the Tribe. The Tribe already implements policies and programs to reduce losses to life and property from hazards. This Plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation can be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Tribe community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This could include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the Tribe will be in a better position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal programs and earmarked funds, benefit assessments, and other state and federal grant programs, including those that can serve or support multi-objective applications.

Responsibility for Implementation of Goals and Activities

The elected officials and staff appointed to head each department within the Tribe are charged with implementation of various activities in the THMP. During the quarterly reviews as described later in this section, an assessment of progress on each of the goals and activities in the THMP should be determined and noted. At that time, recommendations were made to modify timeframes for completion of activities, funding resources, and responsible entities. On an annual basis, the priority standing of various activities may also be changed. Some activities that are found not to be doable may be deleted from the Plan entirely and activities addressing problems unforeseen during plan development may be added.

7.1.1. Role of the Tribal Hazard Mitigation Planning Committee (THMPC) in Implementation and Maintenance

With adoption of this Plan, the participating jurisdictions will be responsible for the THMP implementation and maintenance. The THMPC identified in Appendix A (or a similar committee) will reconvene annuallyeach year to ensure mitigation strategies are being implemented and the Tribe continues to maintain compliance with the NFIP. As such, Tribe will continue its relationship with the THMPC, and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in the implementation and update of this Plan;
- Report on plan progress and recommended changes to the Tribal Council; and
- Inform and solicit input from the public.

The primary duty of the Tribe and THMPC is to see the THMP successfully carried out and to report to their governing board and the public on the status of THMP implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the Tribe website.

7.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate THMP implementation and to update this Plan as progress, roadblocks, or changing circumstances are recognized.

7.2.1. Maintenance Schedule

The Tribal Council (until the Tribe Office of Emergency Services can be established) is responsible for initiating plan reviews. In order to monitor progress and update the mitigation strategies identified in the mitigation action plan, Tribe OES and the THMPC will revisit this plan annualy each year and following a hazard event. The THMPC will also submit a five-year written update to the State and FEMA Region VII, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this THMP anticipated to be fully approved and adopted in late-2023, the next formal THMP Update for

the Tribe Planning Area will occur in 2028. With a formal FEMA Plan approval required in 2028 for the next THMP, Tribe OES will initiate efforts to obtain a planning grant for the 2028 THMP Update in 2026, with a new THMP development process initiated in 2027.

7.2.2. Maintenance Evaluation Process

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

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).
- Increased vulnerability resulting from unforeseen or new circumstances.

Updates to this THMP will:

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

Changes will be made to this Plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. All mitigation actions will be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation. Updating of this THMP will be by written changes and submissions, as the THMPC deems appropriate and necessary, and as approved by the governing boards of each participating jurisdiction. In keeping with the five-year update process, the THMPC will convene public meetings to solicit public input on this Plan and its routine maintenance and the final product will be again adopted by the governing boards of each participating jurisdiction.

Annual Plan Review Process

For the THMP Update review process, the Vice Chairman (until a Tribal OES person is hired), will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the THMP. The THMP is intended to be a living document. The review of the 2023 THMP Update will normally occur on a annual basis each year and will be conducted by the THMPC as follows:

- The Cive-Chairman or the Tribe OES will place an advertisement in the local newspaper advising the public of the date, time, and place for each quarterly review of the Plan Update and will be responsible for leading the meeting to review the Plan.
- Notices will be mailed to the members of the THMPC, federal, state, and local agencies, non-profit groups, local planning agencies, representatives of business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- Tribal officials will be noticed by email and telephone or personal visit and urged to participate.

- Members of the Tribe's Planning Commission and other appointed commissions and groups will also be noticed by email and either by telephone or personal visit.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- The local news media will be contacted, and a copy of the current Plan will be available for public comment at the Tribal Headquarters.

Criteria for Annual Reviews

The criteria recommended in 44 CFR 201 and 207 will be utilized in reviewing and updating the Plan. More specifically, the reviews should include the following information:

- Tribal growth or change in the past quarter.
- The number of substantially damaged or substantially improved structures by flood zone.
- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events descriptions.
- Documented damages due to the event.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Hazard Mitigation Plan. Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the 2023 THMP Update recommendations and their underlying principles into other Tribe plans and mechanisms. Where possible, Plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in Section 7.1 of this plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The point is re-emphasized here. As described in this THMP's capability assessment, the Tribe already implements policies and programs to reduce losses to life and property from hazards. This Plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- Tribe general plans

- Tribe Emergency Operations Plans and other emergency management efforts
- Tribe ordinances
- Flood/stormwater management/master plans
- Community Wildfire Protection plans
- Capital improvement plans and budgets
- Other plans and policies outlined in the capability assessment
- Other plans, regulations, and practices with a mitigation focus

THMPC members involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this THMP with these other plans, programs, etc., as appropriate. As described in Section 7.1 Implementation, incorporation into existing planning mechanisms will be done through the routine actions of:

- monitoring other planning/program agendas;
- attending other planning/program meetings;
- participating in other planning processes; and
- monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Examples of incorporation of the THMP into existing planning mechanisms include:

1. Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in existing and additional Community Wildfire Protection Plans or Fire Management Plans.
2. Integration of many of the infrastructure, roads, and facility improvement projects with the Tribal Capital Improvement Programs.
3. Use of risk assessment information to inform future updates of the hazard analysis in the Tribe Emergency Operations Plans.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this hazard mitigation plan.

7.2.4. Continued Public Involvement

Continued public involvement is imperative to the overall success of the Plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stores from the THMP implementation and seek additional public comment. The Plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and through public hearings.

Public Involvement Process for Quarterly Reviews

The public will be noticed by placing an advertisement in the newspaper specifying the date and time for the review and inviting public participation. The THMPC, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the THMPC reconvenes for the next THMP Update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the Plan. In reconvening, the THMPC plan to identify a public outreach subcommittee, which will be responsible for coordinating the activities necessary to involve the greater public. The subcommittee will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held, and public comments will be solicited on the THMP Update draft.

Appendix A Planning Process

A.1 Lists of THMPC Invites/Stakeholders

A.1.1. THMP Invite List

Name	Department/Agency
Santee Sioux Nation	
Robert Henry	Police Dept.
Seymour Brandt	Fire Department/Utilities
Dewayne Traverse	BIA Firefighters
Mike Crosley	Land Management/Transit
Devin Henry	Economic Development and Grant Writing
Misty Flowers	THPO
LeeAnn Payer	Utilities
Diane Lapointe	Higher Education
Alisha Bartling	EPA Department
Lavonne Jones	Finance
Mike Henry	Service Unit Director - Health and Wellness
Roger Trudell	NICC Extension Office
Dan Redowl	Chief Executive Officer
Dalton Miller	EMS Director
Ken Derby Jr.	Food Distribution Program
Page Hingst	–
Don LaPointe Jr.	Parks and Wildlife
Justin Avery	Water Manager - SSN O3P
Alonzo Denney	Chairman
Stuart Redwing	SSN Tribal Council
Larry Thomas	THPO/Casinos
Carrie Rouillard	SSN District Representative - Council
Danielle Rossler	NCDHD Emergency Response Coordinator
Cindy Nagel	Elementary Principal
Chelsey Chohon	Santee Community Schools
Kameron Runnels	Vice Chair
Joyce Thomas	Head Start
Byron Tuttle	SSN Tribal Council

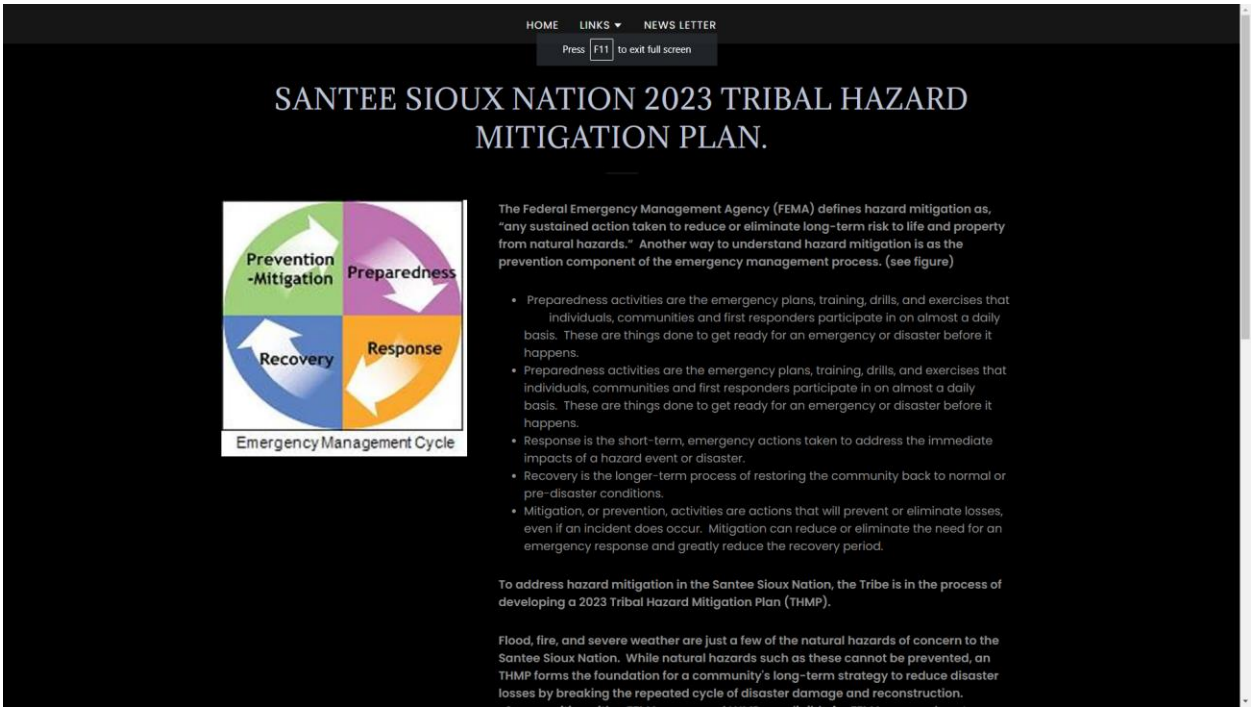
Name	Department/Agency
Andrea McBride	Society of Care (SOC)
Jamisina Webster	SOC (Director: substance abuse Prevention)
Eliza Thomas	SSN
Maunka Morgan	SSN Enterprises
Wakiyan Thomas	Tribal Courts
Diana Thomas	–
Michael Clossman	Cap Office
Other Agencies/Groups	
Victoria Champaign	Ponca Tribe
Kelsy Jelinek	Knox County Emergency Manager
Bobbi Risor	Region 11 Emergency Management
Sara Henry	FEMA
Doyle Hazen	North Central Power Company
Todd Zimmerer	North Central Power Company
Brenda Wabasha	Member of the Public
Adrianna Duarte	Member of the Public

A.1.2. THMPC Participant List

Name	Department/Agency
Santee Sioux Nation	
Robert Henry	Police Dept.
Seymour Brandt	Fire Department/Utilities
Dewayne Traverse	BIA Firefighters
Mike Crosley	Land Management/Transit
LeeAnn Payer	Utilities
Diane Lapointe	Higher Education
Alisha Bartling	EPA Department
Dan Redowl	Chief Executive Officer
Page Hingst	–
Justin Avery	Water Manager - SSN O3P
Alonzo Denney	Chairman
Stuart Redwing	SSN Tribal Council
Larry Thomas	THPO/Casinos
Carrie Rouillard	SSN District Representative - Council
Danielle Rossler	NCDHD Emergency Response Coordinator
Cindy Nagel	Elementary Principal

Name	Department/Agency
Chelsey Chohon	Santee Community Schools
Kameron Runnels	Vice Chair
Joyce Thomas	Head Start
Byron Tuttle	SSN Tribal Council
Andrea McBride	Society of Care (SOC)
Jamisina Webster	SOC (Director: substance abuse Prevention)
Eliza Thomas	SSN
Maunka Morgan	SSN Enterprises
Wakiyan Thomas	Tribal Courts
Diana Thomas	–
Michael Clossman	Cap Office
Other Agencies/Groups	
Victoria Champaign	Ponca Tribe
Doyle Hazen	North Central Power Company
Todd Zimmerer	North Central Power Company
Brenda Wabasha	Member of the Public
Adrianna Duarte	Member of the Public

A.2 Website for Hazard Mitigation Plan



A.3 Kickoff Meeting

A.3.1. Kickoff Meeting Invite to THMPC and Stakeholders

From: Kameron Runnels <kameron.runnels@ssndakota.com>
Sent: Wednesday, May 24, 2023 2:59 PM
To: Santee_police <Santee_police@yahoo.com>; Seymour_brandt <Seymour_brandt@yahoo.com>; DuwayneTraversie <Duwayne.Traversie@bia.gov>; mikecrosley <mike.crosley@yahoo.com>; devinhenry <devin.henry@ssndakota.com>; LeeAnnPayer <LeeAnnPayer@yahoo.com>; DianeLapointe <Diane.Lapointe@ssndakota.com>; Alishabartling <Alisha.bartling@santeeoep.com>; Ljone <Ljone@hartel.net>; Mikehenry <Mike.henry@ihs.gov>; rtrudell <rtrudell@santeedakota.org>; dannyredowl <danny.redowl@ssndakota.org>; altonmiller <alton.miller@ihs.gov>; Kenderby87 <Kenderby87@gmail.com>; pagehingst <page.hingst@santeeoep.com>; knoxema <knoxema@knoxcountyne.gov>; brisor <brisor@norfolkne.gov>; toddzimmerer <todd.zimmerer@ncppd.net>; Chris Morrison <chris.morrison@morrisonplanning.com>; Nicole Morrison <nicole.morrison@morrisonplanning.com>; Larry Thomas <larry.thomas@ohiyacasino.com>; Roger Trudell <rtrudell@thenicc.edu>; Cnagel <cnagel@santeeschools.org>; PhilJaquith <phil.jaquith@ihs.gov>; Sidney Tuttle <sidney.tuttle@ssndakota.com>; Misty Flowers <misty@nicwc.org>; Alonzo Denney <alonzo.denney@ssndakota.com>; victoria champaign <vchampaign@poncatribe-ne.org>
Subject: Kickoff Meeting Invite

Santee Sioux Nation THMP: Kickoff Meeting Email Invite

Greetings:

The Santee Sioux Nation is kicking off efforts to develop a Tribal Hazard Mitigation Plan (THMP). The purpose of the THMP process is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in the Tribe. The Disaster Mitigation Act of 2000 (DMA 2000) requires that tribal governments have a FEMA-approved THMP in place in order to be eligible for certain pre- and post-disaster mitigation funding to protect communities from future disaster related losses. You are receiving this notice because we would like to invite you to take part in the LHMP development process as a member of the Tribal Hazard Mitigation Planning Committee (THMPC).

Tribe, agency, and stakeholder participation and coordination is a requirement of an approved plan, as is the inclusion of any hazard data, information, and mitigation projects your department or agency may want to see included in the THMP. Thus, your input will be critical to the success of this project. Participation includes:

- Attending and participating in the THMPC meetings (5 anticipated over the next 7 months)

- Providing available data/information requested of the THMPC

- Reviewing and providing comments on the plan drafts

The Vice Chairman of the Santee Sioux Nation is taking the lead on coordinating this project for the Tribe. A project kickoff meeting will be held at the following location and time:

June 7, 2023 1:30 pm - 3:30 pm,

Santee Sioux Nation
Tribal Council Headquarters/Museum
108 Spirit Lake Ave W.
Niobrara, NE 68760

The kickoff meeting will explain the process and how you can be involved. A public stakeholder meeting will also be held the evening of the same day of the kickoff meeting. Details on the public meeting will be forthcoming.

Please RSVP and plan on attending or delegating attendance to this important meeting.

Santee Sioux Nation 1

Tribal Hazard Mitigation Plan

May 2023

Kameron Runnels
Vice Chairman
Santee Sioux Nation
Tribal Council

office: 402-857-2772
cell: 402-992-2359

A.3.2. Kickoff Meeting Agenda

AGENDA

Santee Sioux Nation Tribal Hazard Mitigation Plan (THMP)

Planning Team (Kickoff) Meeting #1

June 7th, 2023

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC)
4. Planning for Public Input
5. Coordinating with other Agencies
6. Hazard Identification
7. Schedule
8. Data Needs
9. Questions and Answers

A.3.3. Kickoff Meeting Sign In Sheets

SIGN-IN SHEET

Santee Sioux Nation Tribal Hazard Mitigation Planning Project Planning Team (Kickoff) Meeting #1 - June 7th, 2023

Name/Title	Email Address	Phone	Organization/Affiliation
Todd Zimmerer Operations Mgr	Todd.zimmerer@nppd.net	402-358-5112	North Central PPD
Doyle Hazen General Manager	doyle.hazen@nppd.net	"	"
ALISHA BARTLING / Director	alisha.bartling@santeeoep.com	402-644-1770	SSN OEP
Justin Avery / Water Manager	justin.avery@santeeoep.com	402-644-1770	SSN OEP
Seymour Brandt		402-454-5595	Fire Chief / operator
Duwayne Tomaska	duwayne.tomaska@bia.gov	605-730-2989	BIA - wildfire
Alonzo Denney	alonzo.denney@ssndakota.com	(402)360-5939	SSN Tribal Council
Stuart Redwing	redwing-1862@yahoo.com	402-857-2272	SSN Tribal Council
Leroy Thomas	SSN.thpo@gmail.com	402-358-6141	THPO / Casino
Rob Henry	Santee_police@yahoo.com	402-857-2527	SSN Law Enforcement
Dan Redwing	danny.redwing@ssndakota.com	402-857-23[illegible]	SSN
LeeAnn Prayer	leeannprayer@yahoo.com	4023407645	SSN utilities
Carrie Rowland	Carrielr2018@gmail.com	402-360-5913	SSN District Representative

Name/Title	Email Address	Phone	Organization/Affiliation
Danielle Roessler - NCDHD Emergency Response Coordinator	danielle@ncdhd.ne.gov	402 336 0406	NCDHD
Cindy Nagel - Elem Principal	cnagel@santeeschools.org	605 464-8925	Santi Community School
Chelsey Chorion	cchorion@santee-schools.org	402-394-8520	Santee Community Schools
Kameron Runnels Vice chair	kameron.runnels@ssndakota.com		SSN Tribal Council
Byron Tuttle	King_tut004@yahoo.com	402-360-5230	TRIBAL COUNCIL

A.4 Risk Assessment Meeting

A.4.1. Risk Assessment Meeting Invite to THMPC and Stakeholders

Greetings:

You are invited to attend the 2nd Tribal Hazard Mitigation Planning Committee (THMPC) Meeting for the development of the Santee Sioux Nation's 2023 Tribal Hazard Mitigation Plan (THMP):

July 19, 2023, 1:30 pm - 3:00 pm, Tribal Headquarters

Earlier this year, the Santee Sioux Nation initiated the development of an THMP for the Tribe. Many of you attended the HMPC kickoff meeting in June. Since the kickoff meeting, the Morrison Planning team and Tribal staff have been working to collect data to develop Chapter 4 of the LHMP, the Risk Assessment Chapter. During THMPC Meeting #2, the committee will be reviewing the risk assessment data developed to-date and are looking for your feedback in refining and adding to the working draft Risk Assessment Chapter.

Please RSVP to me and plan on participating (or delegating your participation).

Thanks everyone!

P.S. We have received some Historic Hazard Worksheets. They were originally due on June 30th. Morrison Planning has agreed to extend that deadline to July 12th. Anyone (the planning committee, the public, and other stakeholders) can complete this worksheet. Remember, if you have information such as emails, after action reports, news articles, or other source documents, we will take those in lieu of a completed worksheet. Also, it is ok if you don't have all the information requested in the worksheet – the list is there to show you the types of information we would like, as available. **Please return Worksheets and any supporting information to chris.morrison@morrisonplanning.com by July 12th.**

Kameron Runnels
Vice Chairman
Santee Sioux Nation
Tribal Council

office: 402-857-2772
cell: 402-992-2359

A.4.2. Risk Assessment Meeting Agenda

AGENDA

Santee Sioux Nation Tribal Hazard Mitigation Plan (THMP)

Planning Team (Risk Assessment) Meeting #2

July 19, 2023

1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment (PowerPoint)
4. Open Discussion and Input on the Risk Assessment
5. Review of Data Needs
6. Next Steps

A.4.3. Risk Assessment Meeting Sign In Sheets

SIGN-IN SHEET

Santee Sioux Nation Tribal Hazard Mitigation Planning Project Planning Team (Risk Assessment) Meeting #1 – July 19, 2023

Name/Title	Email Address	Phone	Organization/Affiliation
Caitlyn Morrison	caitlyn.m.morrison@gmail.com	720-454-2218	Morrison Planning
Nicole Morrison	chrisloresnicole@yahoo.com	701-318-4444	Morrison Planning
Kameron Runnels	kameron.runnels@ssndakota.com	402-857-2772	Santee Sioux Nation Tribal Council
Danielle Raessler	danielle@ncdhd.ne.gov	402-336-2406	NCDHD
Mike Crosley	mike.crosleye4@yahoo.com	402-644-1891	Land Management
Alonzo Denney	Alonzo.denney@ssndakota.com	(402)857-2772	Santee Sioux Nation
Alisha Barfling	ALISHA.BARFLING@santeeoep.com	402-857-3347	SSN OEP
Justin Avery	justin.avery@santeeoep.com	402-857-3347	SSN OEP
Page Hingst	page.hingst@santeeoep.com	402-644-1627	SSN OEP
Dan Redowl	danny.redowl@ssndakota.com	402.857.2302	SSN CEO
Seymour Brandt	Seymourbrandt@yahoo	402 454-5595	Santee Utilities
Tori Champagn PTN EM	vchampagn@[illegible]tribe-nsn.org	531-389-2948	PTN EM

A.5 Mitigation Strategy Meeting

A.5.1. Mitigation Strategy Meeting Invite to THMPC and Stakeholders

From: Kameron Runnels <kameron.runnels@ssndakota.com>
Sent: Wednesday, September 6, 2023 8:37 AM
To: Santee_police <Santee_police@yahoo.com>; Seymour_brandt <Seymour_brandt@yahoo.com>; DuwayneTraversie <Duwayne.Traversie@bia.gov>; mikecrosley <mike.crosley@yahoo.com>; devinhenry <devin.henry@ssndakota.com>; LeeAnnPayer <LeeAnnPayer@yahoo.com>; DianeLapointe <Diane.Lapointe@ssndakota.com>; Alishabartling <Alisha.bartling@santeeoep.com>; Ljone <Ljone@hartel.net>; Mikehenry <Mike.henry@ihs.gov>; dannyredowl <danny.redowl@ssndakota.com>; daltonmiller <dalton.miller@ihs.gov>; Kenderby87 <Kenderby87@gmail.com>; pagehingst <page.hingst@santeeoep.com>; justinavery <justin.avery@santeeoep.com>; alonzodenney <alonzo.denney@ssndakota.com>; redwing_1862 <redwing_1862@yahoo.com>; ssnthpo <ssn.thpo@gmail.com>; Carrielr2018 <Carrielr2018@gmail.com>; danielle <danielle@ncdhd.ne.gov>; cnagel <cnagel@santeeschools.org>; cchohon <cchohon@santeeschools.org>; kameronrunnels <kameron.runnels@ssndakota.com>; king_tut004 <king_tut004@yahoo.com>; vchampaign <vchampaign@poncatribe-ne.org>; knoxema <knoxema@knoxcountyne.gov>; sarahenry <sara.henry@fema.dhs.gov>; doylehazen <doyle.hazen@ncppd.net>; toddzimmerer <todd.zimmerer@ncppd.net>; Chris Morrison <chris.morrison@morrisonplanning.com>; Nicole Morrison <nicole.morrison@morrisonplanning.com>; caitlynmmorrison <caitlyn.m.morrison@gmail.com>; aduarte9316 <aduarte9316@gmail.com>; Roger Trudell <rtrudell@thenicc.edu>; Thelma Thomas <thelma.thomas@ohiyacasino.com>; Carrie Rouillard <crouillard@societyofcare.org>; Larry Thomas <larry.thomas@ohiyacasino.com>; Foxylady_2650 <foxylady_2650@yahoo.com>; franklinwhipple <franklin.whipple@yahoo.com>; Waylon LaPlante <waylon.laplante79@yahoo.com>; Davehenrysr2020 <davehenrysr2020@gmail.com>
Subject: THMPC Meeting #3

Greetings:
You are invited to attend the 3rd Tribal Hazard Mitigation Planning Committee (THMPC) Meeting for the development of the Santee Sioux Nation's 2023 Tribal Hazard Mitigation Plan (THMP). Earlier this year, the Santee Sioux Nation initiated the development of an THMP for the Tribe. Many of you attended the THMPC Kickoff meeting in June and the Risk Assessment meeting in July.

This upcoming meeting is the most important phase of the THMP planning process – the Mitigation Strategy. This is where we need input of all kinds from all stakeholders. During the meetings we will be doing a goal setting exercise, as well as identifying and evaluation potential mitigation actions and projects for reducing the risk and vulnerability of the SSN to identified hazards and disasters. The meeting will be held as follows:

September 20th, 2023, 1:30 pm - 4:00 pm, Tribal Headquarters

How to prep for these meetings

1. **Identify and bring your mitigation project ideas to the meetings**. Pease make sure everyone attends that has mitigation actions and projects to include in the THMP for all identified priority hazards.

2. **Review the attached FEMA publication – Mitigation Ideas**. Take a look at this document. You can skim through it and it will give you mitigation ideas by hazard. What fits best for the SSN?

Please RSVP to me and plan on participating (or delegating your participation). **Everyone with mitigation project ideas should attend**. SSN and related agency participation and coordination is a FEMA requirement of an approved plan, as is the inclusion of any hazard data, information, and mitigation projects you may want to see included in the THMP. Your continued participation and input are critical to the success of this project.

Thanks everyone!

Kameron Runnels
Vice Chairman
Santee Sioux Nation
Tribal Council

office: 402-857-2772
cell: 402-992-2359

A.5.2. Mitigation Strategy Meeting Agenda

AGENDA

Santee Sioux Nation Tribal Hazard Mitigation Plan (THMP)

Planning Team (Mitigation Strategy) Meeting #3

September 20, 2023

1. Introductions
2. Risk Assessment Summary Overview
3. Status of the DMA Planning Process
4. Priority Hazards Review
5. Develop Plan Goals
6. Review Mitigation Categories and Selection Criteria
7. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
8. Prioritization of Mitigation Actions/Projects
9. Questions

A.5.3. Mitigation Strategy Meeting Sign In Sheets

SIGN-IN SHEET

Santee Sioux Nation Tribal Hazard Mitigation Planning Project Planning Team (Mitigation Strategy) Meeting #1 – September 20, 2023

Name/Title	Email Address	Phone	Organization/Affiliation
Joyce Thomas Director	joycethomas555@yahoo	402-857-2138	Head Start
Doyle Hazen CEO NCPPD	doylehazen@ncppd.net	4023585112	NCPPD
Todd Zimmerer NCPPD	todd.zimmerer@ncppd.net	402-358-5112	North Central PPD
Jamisina Webster Director of Substance Abuse Prevention	Jwebster@societyofcare.org	402-857-2300	Society of Care
Danielle Roessler Emergency Response Coordinator	danielle@ncdhd.ne.gov	402 336 2406	North Central District Health Dept.
Michael [illegible] IT Manager	santee-admin@ssndakota.com	402 857 2302	[illegible]
Mike Crosby	mike.crosby@yahoo.com	644-1891	Land Mng.
Deana Thomas	deana.[illegible]@ssndakota	4023605282	[illegible]
Wakiyan Thomas	Wakiyan.Thomas@ssndakota	402-360-1315	Tribal Courts
Kameron Runnels	Kameron.Runnels@ssndakota.com	402-857-2772	SSN-Council
Carrie Rouillard	CRouillard@SocietyofCare.org	402-360-5913	SSN Council
Victoria (Tori) Champaign	vchampaign@poncatribe-ne.org	531-389 2948	PTN
Seymour Brandt		402-454-5595	SSN-
Andrea McBride	amcbride@societyofcare.org	4023025238	SOC

Name/Title	Email Address	Phone	Organization/Affiliation
Mahuka Morgan	mahuka.morgan@ssndakota.com	989-948-8884	SSN Enterprises
Dan ReDowl	danny.redowl@ssndakota.com	582-4553	SSN
Eliza Thomas	eliza.thomas@ssndakota.com	402-857-2302	SSN
Larry Thomas	SSN.THPO@Gmail	402-358-6161	THPO
Alisha Bartling	alisha.bartling@santeeoep.com	[illegible] 402-640-2675	SSN OEP
Justin Avery	justin.avery@santeeoep.com		
Rob Henry	Santee-Police@yahoo.com	402-857-2527	Law Enforcement

A.6 Final THMPC Meeting

A.6.1. Final Meeting Invite to THMPC and Stakeholders

From: Chris Morrison
Sent: Monday, November 6, 2023 7:09 AM
To: Santee_police@yahoo.com; Seymour_brandt@yahoo.com; Duwayne.Traversie@bia.gov; mike.crosley@yahoo.com; devin.henry@ssndakota.com; LeeAnnPayer@yahoo.com; Diane.Lapointe@ssndakota.com; Alisha.bartling@santeeoep.com; Ljone@hartel.net; Mike.henry@ihs.gov; danny.redowl@ssndakota.com; dalton.miller@ihs.gov; Kenderby87@gmail.com; page.hingst@santeeoep.com; justin.avery@santeeoep.com; alonzo.denney@ssndakota.com; redwing_1862@yahoo.com; ssn.thpo@gmail.com; Carrielr2018@gmail.com; danielle@ncdhd.ne.gov; cnagel@santeeschools.org; cchohon@santeeschools.org; kameron.runnels@ssndakota.com; king_tut004@yahoo.com; vchampaign@poncatribe-ne.org; knoxema@knoxcountyne.gov; sara.henry@fema.dhs.gov; doyle.hazen@ncppd.net; todd.zimmerer@ncppd.net; chris.morrison@morrisonplanning.com; Nicole Morrison <nicole.morrison@morrisonplanning.com>; caitlyn.m.morrison@gmail.com; aduarte9316@gmail.com; joycethomas555@yahoo.com; amcbride@societyofcare.org; Jwebster@societyofcare.org; eliza.thomas@ssndakota.com; maunka.morgan@ssndakota.com; wakiyan.thomas@ssndakota.com; diana.bluebird@ssndakota.com; santee.admin@ssndakota.com
Cc: Caitlyn Morrison <caitlyn.m.morrison@gmail.com>
Subject: Final THMPC Meeting

Greetings:

You are invited to attend the 4th and Final Tribal Hazard Mitigation Planning Committee (THMPC) Meeting for the development of the Santee Sioux Nation's 2023 Tribal Hazard Mitigation Plan (THMP). Earlier this year, the Santee Sioux Nation initiated the development of an THMP for the Tribe. Many of you attended the THMPC Kickoff meeting in June, the Risk Assessment meeting in July, and the Mitigation Strategy Meeting in October.

This will be the final meeting before we submit the THMP to FEMA. During the meetings we will be reviewing any remaining items outstanding so that the SSN can get a FEMA-approved THMP. The meeting will be held as follows:

November 15th, 2023, 1:30 pm - 3:00 pm, Tribal Headquarters

This meeting will be a working meeting. Please review the attached Items to Complete document. It is a Word document that goes along with the attached pdf. That pdf contains the complete Public Review Draft

of the SSN THMPC. Help us fill in any remaining holes. Please RSVP to Vice Chair Runnels and plan on participating (or delegating your participation). Your continued participation and input are critical to the success of this project.

Thanks everyone!

Chris Morrison, MPA, CFM

Owner/Principal Mitigation Planner

Morrison Planning and Consulting, Ltd.

701.318.4445

chris.morrison@morrisonplanning.com

A.6.2. Mitigation Strategy Meeting Agenda

AGENDA

Santee Sioux Nation Tribal Hazard Mitigation Plan (THMP)

Planning Team (Final) Meeting #4

November 15th, 2023

1. Introductions
2. Status of the THMP Planning Process
3. Final HMPC Input: Outstanding Items
4. Final Steps

A.6.3. Final Meeting Sign In Sheets

SIGN-IN SHEET

Santee Sioux Nation Tribal Hazard Mitigation Planning Project Planning Team (Mitigation Strategy) Meeting #1 – November 15th, 2023

Name/Title	Email Address	Phone	Organization/Affiliation
Kameron Runnels - SSN Vice Chair	kameron.runnels@ssn dakota.com	402 857 2772	Santee Sioux Nation
Mike Crosley - Land Mgr	mike.crosley@yahoo.com	402 644-1891	S.S.N.
Anthony Warrior NICC	SanaWarrior@hotmail.com	402-241-5943	NICC
Alisha Bartling EPA	alisha.bartling@santeeoep.com	402-644-1770	SSN OEP
Justin Avery EPA	justin.avery@santeeoep.com	402-644-1770	SSN OEP
Page Hingst EPA	page.hingst@santeeoep.com	402-644-1627	SSN OEP
Dan Redowl CEO	danny.redowl@ssndakota.com	402-857-2302	
Danielle Roessler ERC	danielle@ncdhd.ne.gov	402 336 2406	NCDHD
Byron Tuttle	King.tut004@yahoo.com	402.360.5230	S.S.N
Carrie Rouillard District Rep	Crouillard@societyofcare.org	402-360-5913	SSN
Stuart Redwing	redwing_1862@yahoo.com	402/857/2772	Santee Sioux Nation
Linda Whipple	lwhipple1957@gmail.com	402-340-[illegible]	Santee Sioux Nation
Ellie Roberts	rellen32@yahoo.com	402-857-2302	Santee Sx Nation
Seymour Brandt		402 454 5595	Santee

Santee Sioux Nation
Tribal Hazard Mitigation Plan
November 2023

Planning Team Meeting Sign in Sheet

1

Name/Title	Email Address	Phone	Organization/Affiliation
Chris Morrison	chris.morrison@morrisonplanning.com	701-318-4445	Morrison Planning
Nicole Morrison	nicolemorrisonrdh@gmail.com	701-318-4444	Morrison Planning

A.7 Public Involvement

A.7.1. Early Public Meeting Press Release and Outreach Flyer

Santee Sioux Nation Tribal Hazard Mitigation Plan

Kickoff Meeting – Public Meeting Press Release

The Santee Sioux Nation is developing a 2023 Tribal Hazard Mitigation Plan (THMP). The purpose of this THMP is to assess risk to natural hazards, implement actions to reduce future disaster losses, and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000.

What is Hazard Mitigation?

Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

Why is Natural Hazard Mitigation Important?

Most people who live or work in the Santee Sioux Nation have been affected by natural hazards in one way or another. The Santee Sioux Nation and its members are vulnerable to a variety of hazards including floods, earthquakes, fire, drought, and other severe weather events.

The rising costs associated with disaster response and recovery have focused the attention of federal, state, and local governments on addressing natural hazards before they occur. For example, torrential rains and floods cannot always be prevented from occurring. Planning for hazards and implementing mitigation measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through hazard mitigation.

Tribal Hazard Mitigation Plan Development Process

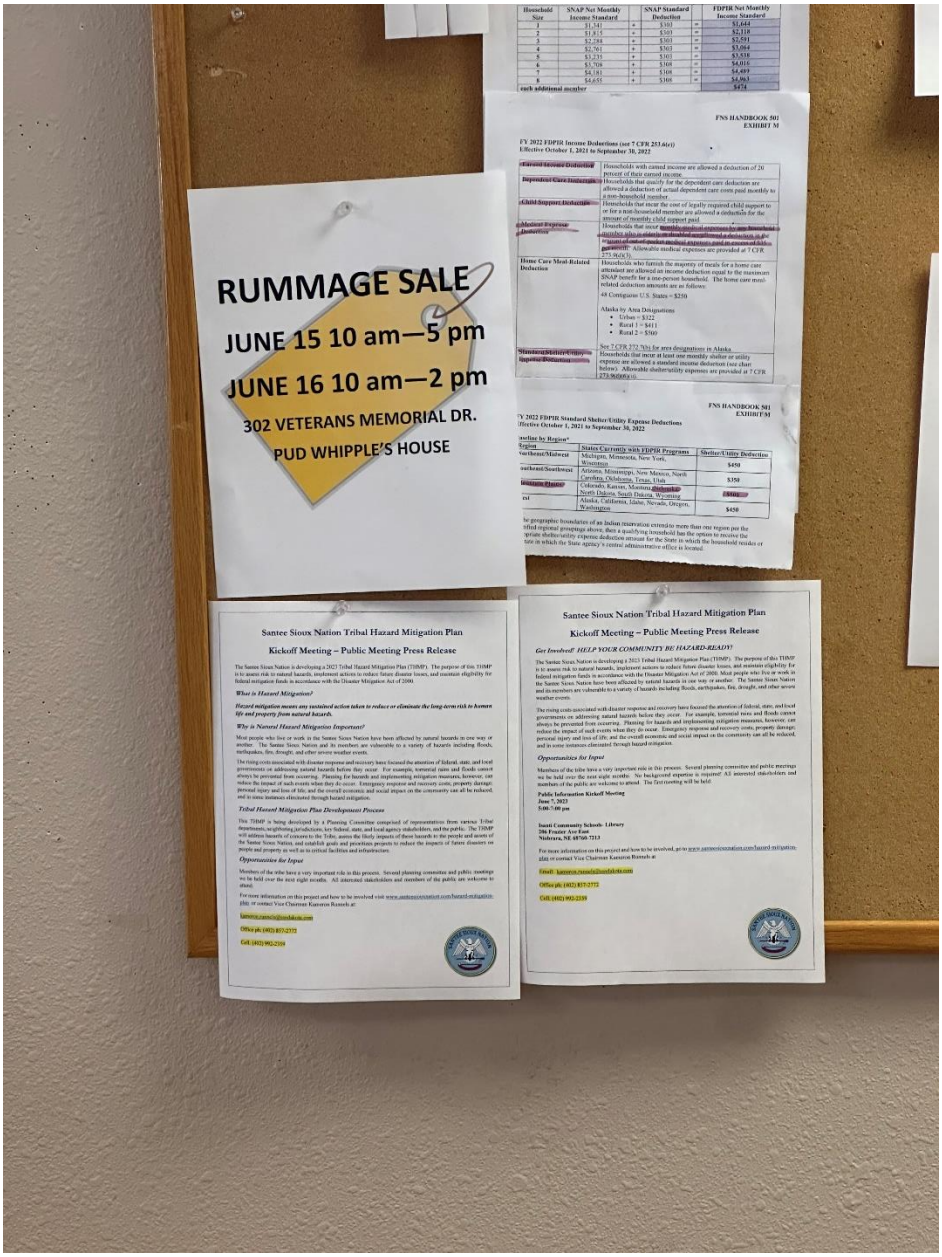
This THMP is being developed by a Planning Committee comprised of representatives from various Tribal departments, neighboring jurisdictions, key federal, state, and local agency stakeholders, and the public. The THMP will address hazards of concern to the Tribe, assess the likely impacts of these hazards to the people and assets of the Santee Sioux Nation, and establish goals and prioritizes projects to reduce the impacts of future disasters on people and property as well as to critical facilities and infrastructure.

Opportunities for Input

Members of the tribe have a very important role in this process. Several planning committee and public meetings we be held over the next eight months. All interested stakeholders and members of the public are welcome to attend.

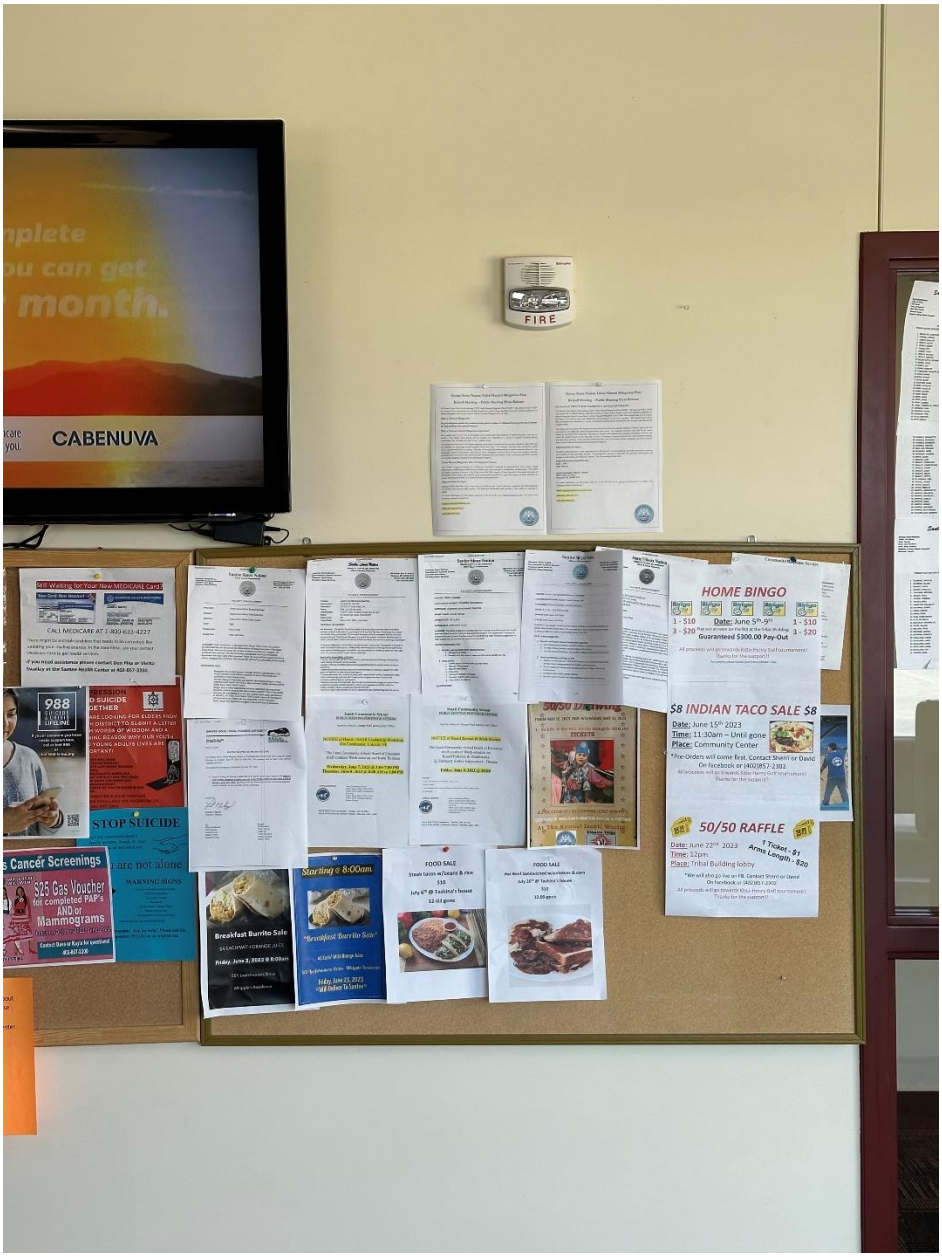
For more information on this project and how to be involved, go to INSERT WEBSITE or contact Vice Chairman Kameron Runnels at INSERT EITHER PHONE, EMAIL, OR BOTH.

A.7.2. Early Public Outreach Flyer at Lakeview C Store

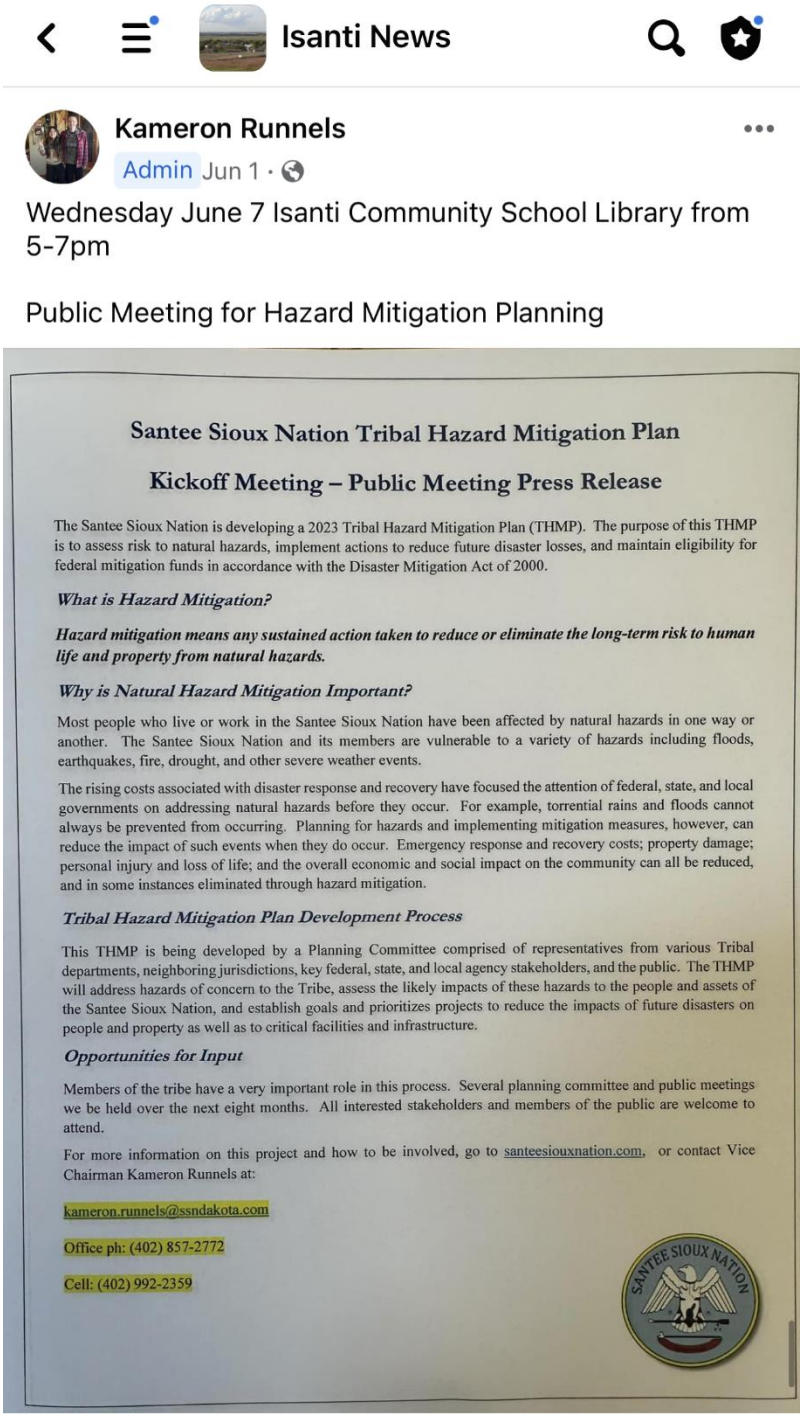


A.7.3. Early Public Outreach Flyer at SSN Grocery Store

A.7.4. Early Public Outreach Flyer at Santee Health Center



A.7.5. Early Public Outreach on Isanti News



Isanti News

Kameron Runnels

Admin Jun 1 ·

Wednesday June 7 Isanti Community School Library from 5-7pm

Public Meeting for Hazard Mitigation Planning

Santee Sioux Nation Tribal Hazard Mitigation Plan

Kickoff Meeting – Public Meeting Press Release

The Santee Sioux Nation is developing a 2023 Tribal Hazard Mitigation Plan (THMP). The purpose of this THMP is to assess risk to natural hazards, implement actions to reduce future disaster losses, and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000.

What is Hazard Mitigation?

Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

Why is Natural Hazard Mitigation Important?

Most people who live or work in the Santee Sioux Nation have been affected by natural hazards in one way or another. The Santee Sioux Nation and its members are vulnerable to a variety of hazards including floods, earthquakes, fire, drought, and other severe weather events.

The rising costs associated with disaster response and recovery have focused the attention of federal, state, and local governments on addressing natural hazards before they occur. For example, torrential rains and floods cannot always be prevented from occurring. Planning for hazards and implementing mitigation measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through hazard mitigation.

Tribal Hazard Mitigation Plan Development Process

This THMP is being developed by a Planning Committee comprised of representatives from various Tribal departments, neighboring jurisdictions, key federal, state, and local agency stakeholders, and the public. The THMP will address hazards of concern to the Tribe, assess the likely impacts of these hazards to the people and assets of the Santee Sioux Nation, and establish goals and prioritizes projects to reduce the impacts of future disasters on people and property as well as to critical facilities and infrastructure.

Opportunities for Input

Members of the tribe have a very important role in this process. Several planning committee and public meetings we be held over the next eight months. All interested stakeholders and members of the public are welcome to attend.

For more information on this project and how to be involved, go to santeesiouxnation.com, or contact Vice Chairman Kameron Runnels at:

kameron.runnels@ssndakota.com

Office ph: (402) 857-2772

Cell: (402) 992-2359

SANTEE SIOUX NATION

A.7.6. Early Public Meeting Agenda

AGENDA

Santee Sioux Nation Tribal Hazard Mitigation Plan (THMP)

Public (Kickoff) Meeting #1

June 7th, 2023

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. Hazard Identification & Profiles
4. Opportunities for Public Participation and Input
5. Schedule
6. Questions and Answers

A.7.7. Early Public Meeting Sign In Sheet

SIGN-IN SHEET

Santee Sioux Nation Tribal Hazard Mitigation Planning Project Public (Kickoff) Meeting #1 - June 7th, 2023

Name/Title	Email Address	Phone	Organization/Affiliation
Brenda Wabasha		402-394-5992	
Adrianna Narte	aduarte9316@gmail.com	4029058597	
Cindy Nagel		605-464-8928	
Kameron Runnels Vice Chair	kameron.runnels@ssnation.com	402-992-2359	Santee Sioux Nation Tribal Council
Alonzo G Denney Chair	alonzo.denney@ssndakota.com	(402) 360-5939	Tribal Council Santee Sioux Nation
Caitlyn Morrison	caitlyn.m.morrison@gmail.com	720-459-2218	Morrison planning
Chris Morrison	Chris.Morrison@Morrisonplanning.com	(701) 319-4445	Morrison Planning

A.7.8. Final Public Meeting Flyer

Santee Sioux Nation Tribal Hazard Mitigation Plan

Final Public Meetings

Get Involved! HELP YOUR COMMUNITY BE HAZARD-READY!

The Santee Sioux Nation is developing a 2023 Tribal Hazard Mitigation Plan (THMP). The purpose of this THMP is to assess risk to natural hazards, implement actions to reduce future disaster losses, and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000. Most people who live or work in the Santee Sioux Nation have been affected by natural hazards in one way or another. The Santee Sioux Nation and its members are vulnerable to a variety of hazards including floods, earthquakes, fire, drought, and other severe weather events.

The rising costs associated with disaster response and recovery have focused the attention of federal, state, and local governments on addressing natural hazards before they occur. For example, torrential rains and floods cannot always be prevented from occurring. Planning for hazards and implementing mitigation measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through hazard mitigation.

The process began in May 2023 with the establishment of a planning committee comprised of Tribal departments and other key stakeholders. The THMP is scheduled to be finalized and submitted to FEMA in November 2023.

Opportunities for Input

Members of the tribe have a very important role in this process. All interested stakeholders and members of the public are welcome to attend. The final meeting will be held:

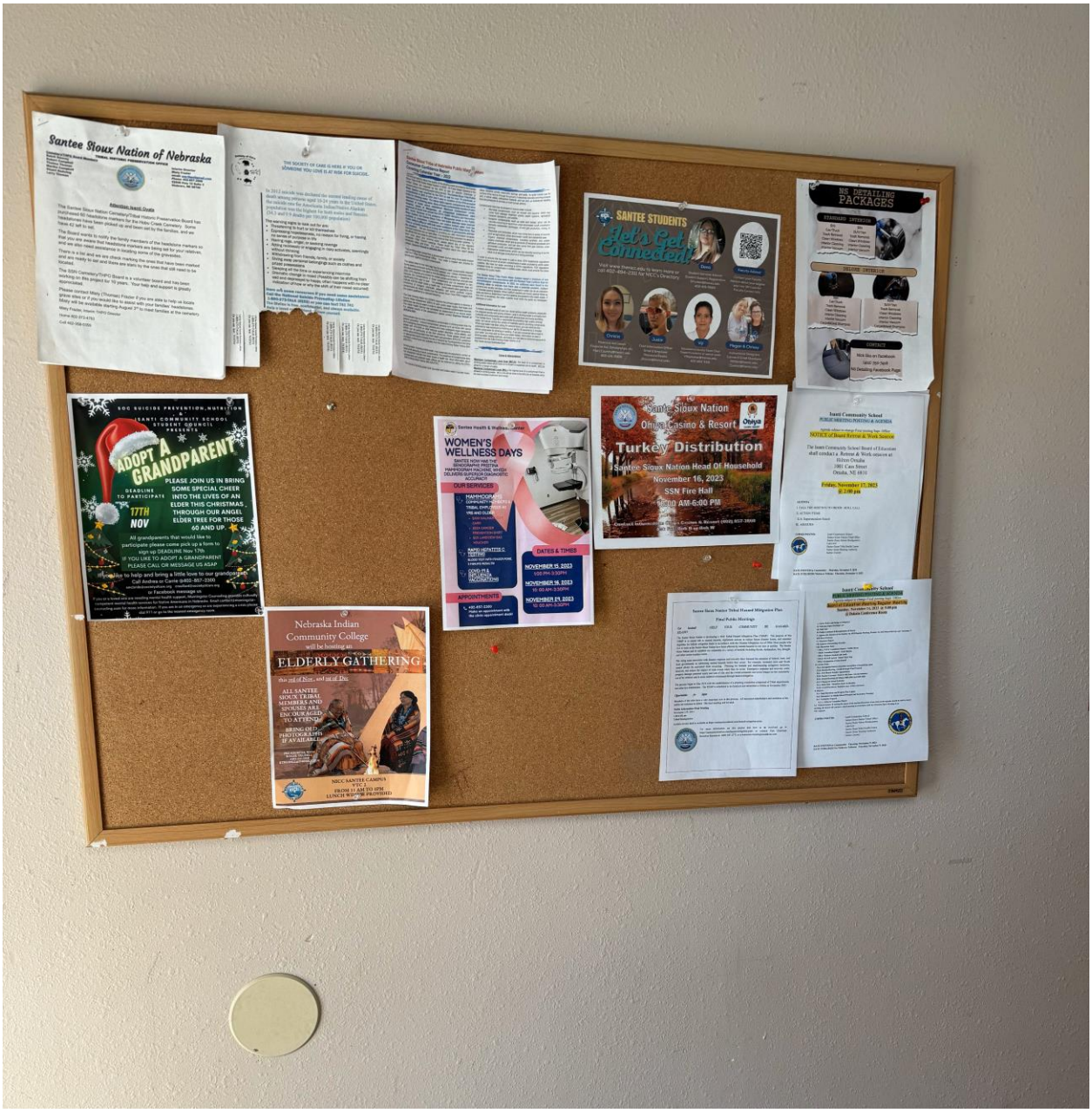
Public Information Final Meeting
November 15th, 2023
5:00-6:00 pm
Tribal Headquarters

A public review draft is available at https://santeesiouxnation.com/hazard-mitigation-plan.

For more information on this project and how to be involved, go to https://santeesiouxnation.com/hazard-mitigation-plan or contact Vice Chairman Kameron Runnels at (402) 857-2772 or at kameron.runnels@ssndakota.com.

A.7.9. Final Public Meeting Outreach at David Frazier Memorial – Tribal Administration Building

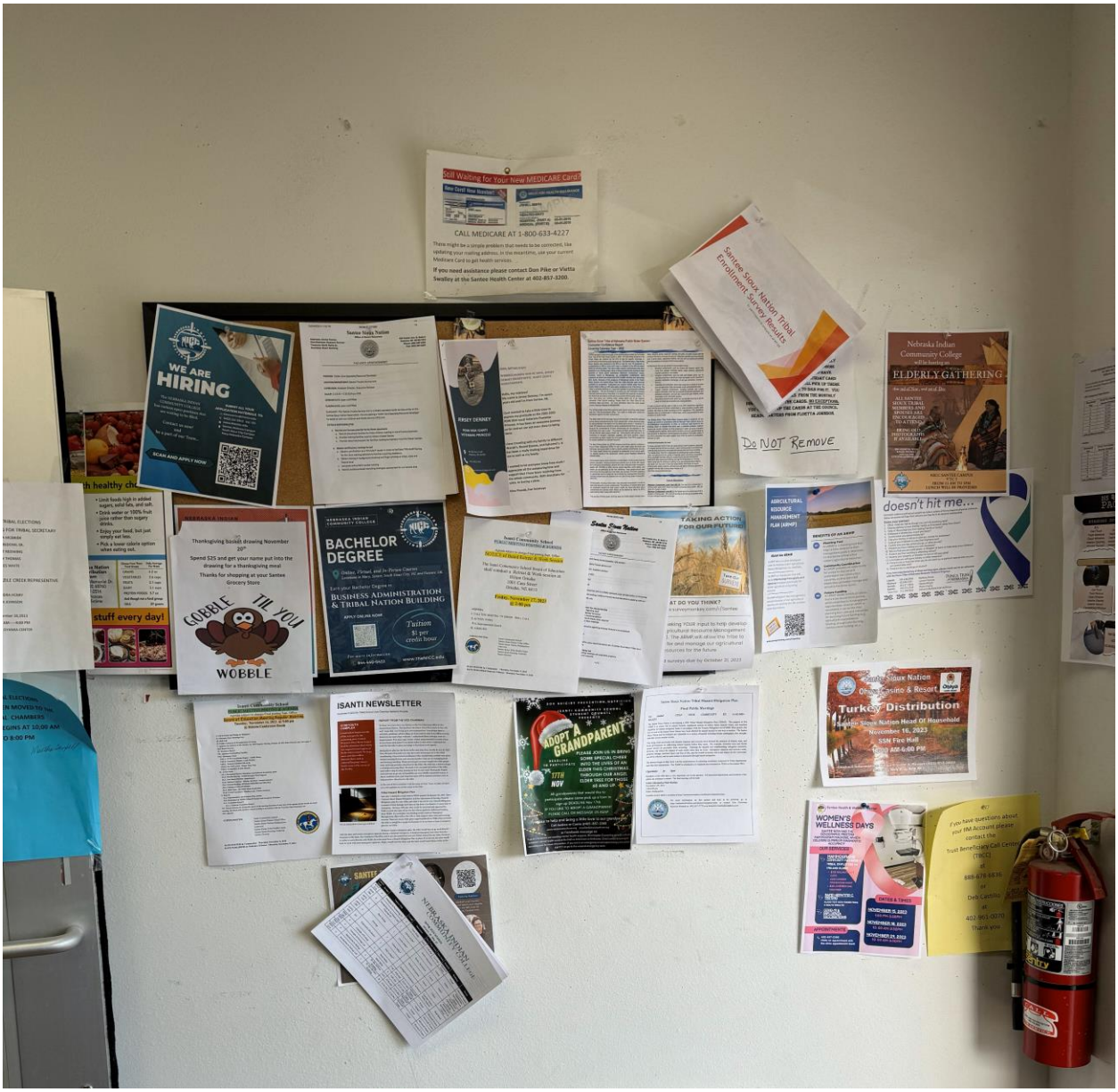
A.7.10. Final Public Meeting Outreach at Lakeview C-Store



A.7.11. Final Public Meeting Outreach at Isanti Community School

A.7.12. Final Public Meeting Outreach at Santee Health and Wellness Center

A.7.13. Final Public Meeting Outreach at SSN Grocery Store



A.7.14. Final Public Meeting Agenda

AGENDA

Santee Sioux Nation Tribal Hazard Mitigation Plan (THMP)

Public (Kickoff) Meeting #2

November 15th, 2023

1. Introductions
2. Overview of the THMP Planning Process
3. Overview of the SSN THMP
4. Public Comments/Input
5. Next Steps

A.7.15. Final Public Meeting Sign In Sheet

SIGN-IN SHEET

Santee Sioux Nation Tribal Hazard Mitigation Planning Project Public (Final) Meeting #1 – November 15th, 2023

Name/Title	Email Address	Phone	Organization/Affiliation
Chris Morrison	chris.morrison@morrisonplanning.com	701-318-4445	Morrison Planning
Nicole Morrison	nicolemorrisonmedia@gmail.com	701-318-4444	Morrison Planning
Kameron Runnels	kameron.runnels@ssnation.com	402-857-2772	Santee Sioux Nation
Carrie Rouillard			
Andrea McBride	amcbride@societyofcare.org	402.322.5238	Santee Sioux Nation

A.8 Meeting Handouts

A.8.1. Kickoff Meeting Handouts

Knox County Disaster Declarations

FEMA Federal Disaster Declarations 1955-2023

Year	Disaster Name	Disaster Type	Disaster #	Federal Declaration Date
2022	Nebraska Severe Storms and Straight-Line Winds	Severe Storm	DR-4662	7/27/2022
2020*	Nebraska Covid-19 Pandemic	Biological (Pandemic)	DR-4521	4/4/2020

Year	Disaster Name	Disaster Type	Disaster #	Federal Declaration Date
2020*	Nebraska Covid-19	Biological (Pandemic)	EM-3483	3/13/2020
2020	Santee Sioux Nation Covid-19	Biological (Pandemic)	EM-3523	3/13/2020
2019*	Nebraska Severe Winter Storm, Straight-line Winds, and Flooding	Flood	DR-4420	3/21/2019
2018	Nebraska Severe Winter Storm and Straight-line Winds	Snow Storm	DR-4375	6/29/2018
2011	Nebraska Flooding	Flood	DR-4013	8/12/2011
2011	Nebraska Flooding	Flood	DR-3323	6/18/2011
2010	Nebraska Severe Storms, Flooding, and Tornadoes	Severe Storm	DR-1924	6/15/2010
2010	Nebraska Severe Winter Storms and Snowstorm	Severe Storm	DR-1878	2/25/2010
2007	Nebraska Severe Storms, Flooding, and Tornadoes	Severe Storm	DR-1706	6/6/2007
2006	Nebraska Severe Winter Storms	Severe Storm	DR-1674	1/7/2007
2005	Nebraska Severe Winter Storm	Severe Storm	DR-1627	1/26/2006
2005	Nebraska Hurricane Katrina Evacuation	Hurricane	EM-3245	9/13/2005
2003	Nebraska Severe Storms and Tornadoes	Severe Storm	DR-1480	7/21/2003
1978	Nebraska Storms, Ice Jams, Snowmelt, Flooding	Flood	DR-552	3/24/1978
1971	Nebraska Floods	Flood	DR-308	7/7/1971
1971	Nebraska Floods	Flood	DR-303	2/23/1971
1967	Nebraska Severe Storms, Flood	Flood	DR-228	7/18/1967

Source: FEMA

*Both Knox County and the Santee Sioux Nation received disaster declarations for this event.

Severe Weather Events

NCDC Severe Weather Events for Knox County 1950-1/31/2023*

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	16	0	0	0	0	$0	$0
Cold/Wind Chill	45	0	0	0	0	$0	$0
Drought	13	0	0	0	0	$0	$0
Excessive Heat	1	0	0	0	0	$0	$0
Extreme Cold/Wind Chill	9	0	0	0	0	$0	$0
Flash Flood	17	0	0	0	0	$79,000	$10,000
Flood	21	0	0	0	0	$151,000	$0
Funnel Cloud	1	0	0	0	0	$0	$0
Hail	294	0	0	5	0	$1,575,000	$4,230,000
Heat	7	0	0	0	0	$0	$0
Heavy Rain	2	0	0	0	0	$0	$0
Heavy Snow	13	0	0	0	0	$0	$0
High Wind	20	0	0	1	0	$53,000	$0
Ice Storm	3	0	0	0	0	$0	$0
Lightning	2	0	0	0	0	$500	$0
Thunderstorm Wind	132	0	0	0	0	$559,000	$0
Tornado	46	1	0	107	0	$5,732,560	$0
Winter Storm	49	0	0	0	0	$3,500,000	$0
Winter Weather	7	0	0	0	0	$0	$0
Total	**698**	**1**	**0**	**113**	**0**	**$11,650,060**	**$4,240,000**

Source: NCDC
*Note: Losses reflect totals for all impacted areas
**Due to the regional nature of reporting certain hazard events, these hazards are included in the NCDC database for Knox County

Hazards Comparison

2020 Lower Elkhorn NRD LHMP	2023 Knox County Plan	2021 State of Nebraska Plan	Proposed Santee Sioux Nation 2023 Hazards
Animal Disease	Animal Disease	Animal Disease	–
Dam Failure	Dam Failure	Dam Failure	Dam Failure
Drought	Drought	Drought	Drought and Water Shortage
Earthquakes	Earthquakes	–	–
Extreme Heat	Extreme Cold	Extreme Temperature	Severe Weather: Extreme Heat

2020 Lower Elkhorn NRD LHMP	2023 Knox County Plan	2021 State of Nebraska Plan	Proposed Santee Sioux Nation 2023 Hazards
Flooding	Flood/Flash Flood	Flood/Flash Flood	Flood: 1% and 0.2% Annual Chance
–	Public Health Epidemic	Human Infectious Disease	–
–	Landslides	–	Landslide
Levee Failure	–	Levee Failure	–
–	Agricultural Plant Disease	Plant Disease and Pests	–
Chemical Fixed Sites and Transportation	Hazardous Materials	–	–
Hail	–	–	Severe Weather: Heavy Rain and Storms
High Winds	High Winds	–	Severe Weather: High Winds and Tornadoes
Severe Thunderstorms	Severe Thunderstorms	Severe Thunderstorm	Severe Weather: Heavy Rain and Storms
Severe Winter Storms	Severe Winter Storms	Severe Winter Storm	Severe Weather: Winter Storms
Terrorism	–	Terrorism	–
Tornado	Tornado	Tornado	Severe Weather: High Winds and Tornadoes
Wildfire (Grass)	Wildfire	Wildfire	Wildfire
–	–	Power Failure	–

Santee Sioux Nation Hazard Identification 2023

Hazard*	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Dam Failure	Extensive	Unlikely	Critical	Low	Medium
Drought and Water Shortage	Extensive	Likely	Negligible	Medium	High
Flood: 1%/0.2% annual chance	Significant	Unlikely	Limited	Medium	High
Landslide	Limited	Likely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rain and Storms	Extensive	Highly Likely	Limited	High	High
Severe Weather: High Wind and Tornado	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Winter Storms	Extensive	Highly Likely	Critical	High	Low
Wildfire	Extensive	Highly Likely	Catastrophic	High	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Probability of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Climate Change Influence
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

A.8.2. Risk Assessment Meeting Handouts

Santee Sioux Nation: 2023 Hazards

- Dam Failure
- Drought and Water Shortage
- Flood: 1%/0.2% annual chance
- Hazardous Materials: Transportation
- Landslide
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms
- Severe Weather: High Wind and Tornado
- Severe Weather: Winter Storms
- Wildfire

Santee Sioux Nation Hazard Identification

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

	Please return worksheets by mail, email, or fax to: Chris Morrison, Morrison Planning and Consulting 2731 155th Ave SE Amenia, ND 58004 email: chris.morrison@morrisonplanning.com
Prepared by:	
Phone:	
Email:	
Date:	

A.8.3. Mitigation Strategy Meeting Handouts

These can be found in Appendix C to this Plan.

A.8.4. Final Meeting Handouts

No handouts were utilized for the final meeting.

Appendix B References

2011 Santee Sioux Nation Community Wildfire Protection Plan

2017-2021 American Community Survey

2020 Lower Elkhorn Natural Resource District Local Hazard Mitigation Plan

2020 North Central Power District Annex to the Nebraska Hazard Mitigation Plan

2021 Nebraska State Hazard Mitigation Plan

2023 Tri-County (including Knox County) Hazard Mitigation Plan

Agency for Toxic Substances and Disease Registry Geospatial Research, Analysis & Services Program

Environmental Protection Agency

ESRI databases

FEMA

FEMA Disaster Declaration Database

Hazus 6.0

Know County FEMA DFIRM (10/2/2015)

Knox County Flood Insurance Study (10/2/2015)

National Drought Mitigation Center

National Institute of Building Science Multi-Hazard Mitigation Council 2019 Interim Report

National Inventory of Dams

National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) Storm Events Database

National Performance of Dams Program

National Register of Historic Places

Nebraska Department of Natural Resources

Nebraska Department of Transportation

Nebraska Forest Service

Nebraska Forest Service Wildfire Risk Explorer

Nebraska Game and Parks Division

NOAA Storm Prediction Center

North Central Public Health

SSN Community Wildfire Protection Plan

State of Nebraska Parcel Data 2022

THMPC input

U.S. Occupational Safety and Health Administration

Union for Concerned Scientists

United States Geological Survey

University of Nebraska-Lincoln - Understanding and Assessing Climate Change: Implications for Nebraska

US Center for Disease Control

US Department of Transportation

US Department of Transportation Pipeline and Hazardous Materials Safety Administration

US Drought Monitor

US Fish and Wildlife Service Environmental Conservation Online System

US National Weather Service

US National Weather Service XMAC website

Vaisala National Lightning Detection Network

World Health Organization

Appendix C Mitigation Strategy

2023 Santee Sioux Nation THMP Status

FEMA's 4-Phase-10 Step DMA/CRS Planning Process

DMA Process	Modified CRS Process
1) Organize Resources	
201.7(c)(1)	1) Organize the Planning Effort
201.7(b)(1)	2) Involve the Public
201.7(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.7(c)(2)(i)	4) Identify the Hazards
201.7(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.7(c)(3)(i)	6) Set Goals
201.7(c)(3)(ii)	7) Review Possible Activities
201.7(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.7(c)(5)	9) Adopt the Plan
201.7(c)(4)	10) Implement, Evaluate, and Revise the Plan

THMP Project Schedule/Key Dates

2023 THMP Update Meetings

- **November 15th** (Wednesday) –HMPC Meeting #5 and Public Meeting #2 (1:30-3:00; 5:30-7:00)

Mitigation Strategy Meetings - Follow up

- **September 27th** (Wednesday) – Mitigation Strategy (goals/actions) follow up sent to SSN.
- **October 13th** (Friday) – Mitigation Action (Project) Worksheets due

THMP Document Drafts

- **October 20th** (Friday) – THMPC (First) Draft LHMP to Client
- **October 31st** (Tuesday) – THMPC comments due on Draft Plan
- **November 3rd** (Friday) – Comments incorporated into Public Review (Second) Draft to THMPC
- **November 6th** (Monday) – Public Review Draft on website

- **November 17th** (Friday) – all THMPC and Public input to Morrison Planning
- **November 22nd** to **27th** (Wednesday to the following Monday) – Public and final comments incorporated and THMP submittal to FEMA

Priority Hazards

SSN Hazard Identification & Profiles

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Dam Failure	Extensive	Unlikely	Critical	Low	Medium
Drought and Water Shortage	Extensive	Likely	Negligible	Medium	High
Flood: 1%/0.2% annual chance	Significant	Unlikely	Limited	Medium	High
Hazardous Materials: Transportation	Significant	Occasional	Limited	Low	Low
Landslide	Limited	Likely	Limited	Medium	Medium
Pandemic	Extensive	Occasional	Critical	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rain and Storms	Extensive	Highly Likely	Limited	High	High
Severe Weather: High Wind and Tornado	Extensive	Highly Likely	Limited	Medium	Medium
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Significance
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Medium: moderate potential impact
High: widespread potential impact

Climate Change Influence
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

Risk Assessment Methodology

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences**: Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences**: Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures**: This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Priority Hazards

- Drought and Water Shortage
- Flood: 1%/0.2% annual chance
- Landslide
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms
- Severe Weather: High Wind and Tornado
- Severe Weather: Winter Storms
- Wildfire

Non-Priority Hazards

- Dam Failure
- Hazardous Materials: Transportation
- Pandemic

Mitigation Strategy: Goals

The most important element of the THMP is the resulting mitigation strategy which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy is comprised of three components:

1. Mitigation Goals
2. Mitigation Actions
3. Mitigation Action (Implementation) Plan

Mitigation Goals

Up to now, the THMPC has been involved in collecting and providing data for the Santee Sioux Nation Tribal Hazard Mitigation Plan. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of the SSN Planning Area to identified hazards and includes an assessment of the area's current capabilities for countering these threats through existing policies, regulations, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating goals will lead to incorporating these improvements into the Mitigation Strategy portion of the THMP. The planning goals should provide direction for what loss reduction activities can be undertaken to make the SSN more disaster resistant.

Mitigation Goals are general guidelines that represent the community's vision for reducing or avoiding losses from identified hazards. Goals are stated without regard for achievement, that is, implementation, cost, schedule, and means are not considered.

Goals are public policy statements that:

- **Represent basic desires of the SSN;**
- **Encompass all aspects of planning area, public and private;**
- **Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;**
- **Are future-oriented, in that they are achievable in the future; and**
- **Are time-independent, in that they are not scheduled events.**

  - ✓ While goals are not specific (quantitative), they should not be so general as to be meaningless or unachievable.
  - ✓ Goal statements may form the basis for objectives. They should be stated in such a way as to develop one or more objectives related to each goal.
  - ✓ The key point in writing goals is to remember that they must deal with results, not the activities that produce those results.
  - ✓ Consider other planning area goals from other regional/county/city programs, plans and priorities.

2021 Nebraska State Hazard Mitigation Plan Goals

- GOAL 1: Promote a comprehensive state hazard mitigation policy framework, to coordinate federal, state and local hazard mitigation planning and program efforts.

- GOAL 2: Reduce or eliminate long-term risk to property, including critical facilities and infrastructure, historic, and private property.
- GOAL 3: Promote public awareness of hazards and how to reduce their impacts.
- GOAL 4: Encourage the development and implementation of long-term, cost effective, and resilient mitigation projects that preserve or restore the functions of natural systems.
- GOAL 5: Build stronger by promoting mitigation actions that emphasize sustainable construction and design measures to reduce or eliminate the impacts of natural hazards.

2023 Tri-County LHMP (including Knox County) Plan Goals

- Goal 1: Protect Health and Safety of Residents
- Goal 2: Reduce Future Losses from Hazard Events
- Goal 3: Increase Public Awareness and Education on Vulnerability to Hazards
- Goal 4: Improve Emergency Management Capabilities
- Goal 5: Pursue Multi-Objective Opportunities

2020 Lower Elkhorn NRD (including Ponca Tribe) LHMP Goals

- Goal 1: Protect Health and Safety of Residents
- Goal 2: Reduce Future Losses from Hazard Events
- Goal 3: Increase Public Awareness and Education on Vulnerability to Hazards
- Goal 4: Improve Emergency Management Capabilities
- Goal 5: Pursue Multi-Objective Opportunities
- Goal 6: Enhance Overall Resilience and Promote Sustainability

NCCPD LHMP Goals

- Goal 1: Protect the Health and Safety of Customers (overall intent of the plan)
- Goal 2: Strengthen the District's Transmission/Distribution System
- Goal 3: Reduce Future Losses from Hazard Events
- Goal 4: Increase Public Awareness and Educate Customers on the Vulnerability to Hazards

Other Example Goal Statements

- Minimize risk and vulnerability from natural hazards
- Increase communities' awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maintain coordination of disaster plans with changing DHS/FEMA needs
- Maintain FEMA eligibility/position jurisdictions for grant funding
- Maintain/enhance the flood mitigation program to provide 100/500-year flood protection
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts

- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents

General Recommendation for Categories of Goals

- Reduce Losses/Protection of Life, Property, Public Health, and the Environment from all Hazards
- Reduce Losses/Protection of Critical Facilities and Infrastructure from all Hazards
- Public Education
- Increase Capabilities to all Hazards
- Any Hazard-specific goals

Goals Development

The purpose of goal's development is to reach a consensus on goals for the SSN 2023 THMP. Provided above are example goals for this THMP. ***You may reword those above or develop your own goals.*** These goal statements should serve as examples. It is vital that our Tribal Hazard Mitigation Planning Committee establish its own goals.

You will each be given 3 sticky notes. On each note you will write what you think the goals for this mitigation planning effort should be. Use one sticky note for each goal.

When done, we will:

- Attach them to the wall/easel-chart and arrange them by category
- Combine and reword them into 3-5 goals for the plan and send them out to the THMPC for further review and refinement.

Mitigation Strategy: Actions

Mitigation Strategy Action Development: Ground Rules

Rule 1: The SSN MUST have a Mitigation Action/Project to address each of their Priority Hazards (those rated as a high or medium significance in their Hazard Identification table).

Rule 2: Every Mitigation Action/Project MUST be supported by Risk Assessment Data contained within Chap 4 of the Base Plan. Note: this might necessitate backfilling the hazard risk assessment data.

Rule 3: The Mitigation Actions/Projects for this 2023 THMP should reflect the SSN's WISH LIST for mitigation, regardless of funding source.

Rule 4: Any Mitigation Action/Project that might be considered for FEMA mitigation grant funding over the next 5-years covered by this THMP MUST be included in this 2023 THMP.

Rule 5: While the updated Mitigation Strategy should include all potential Mitigation Actions/Projects for the SSN (regardless of funding source), keep in mind that the SSN is not obligated to implement ANY of the identified Mitigation Actions/Projects – all are always subject to funding and changing priorities.

Rule 6: Each Mitigation Action/Project to be included in this THMP MUST have a Mitigation Action Worksheet completed by the owning Department or Agency.

Rule 7: The SSN CAN LATER include Mitigation Actions/Projects that might not get identified during this Mitigation Action/Project Prioritization process – the key is to complete a Mitigation Action Worksheet for any project to be included in the THMP prior to submittal to FEMA.

REMEMBER: Having a FEMA approved THMP for the SSN is a prerequisite for being eligible to apply for FEMA pre- and post-disaster mitigation funding.

Mitigation Actions are specific projects and activities that help achieve the goals and accomplish risk reduction in the community.

Categories of Mitigation Actions

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
  - ✓ Subdivision regulations
  - ✓ Building Codes
    - Fire-Wise Construction
  - ✓ Floodplain development regulations
  - ✓ Geologic Hazard Areas development regulations (for roads too!)
- Storm Water Management
- Fuels Management, Fire-Breaks

EMERGENCY SERVICES: protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (flooding, tornadoes, winter storms, geologic hazards, fire)
  - ✓ NOAA Weather Radio
  - ✓ Sirens
  - ✓ "Reverse 911" (Emergency Notification System)
- Emergency Response
  - ✓ Evacuation & Sheltering
  - ✓ Communications
  - ✓ Backup power supply/generators
  - ✓ Emergency Planning
    - Activating the EOC (emergency management)
    - Closing streets or bridges (police or public works)
    - Shutting off power to threatened areas (utility company)
    - Holding/releasing children at school (school district)
    - Ordering an evacuation (tribal council/chair)
    - Opening emergency shelters (Red Cross/BIA)
    - Monitoring water levels (engineering)
    - Security and other protection measures (police)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)
  - ✓ Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
  - ✓ Lifeline Utilities Protection

- Post-Disaster Mitigation
- Building Inspections
  - ✓ ID mitigation opportunities & funding before reconstruction

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

- Retrofitting/disaster proofing
  - ✓ Floods
    - Wet/Dry floodproofing (barriers, shields, backflow valves)
    - Relocation/Elevation
    - Acquisition
    - Retrofitting
  - ✓ High Winds/Tornadoes
    - Safe Rooms
    - Securing roofs and foundations with fasteners and tie-downs
    - Strengthening garage doors and other large openings
  - ✓ Winter Storms
    - Immediate snow/ice removal from roofs, tree limbs
    - "Living" snow fences
  - ✓ Geologic Hazards (Landslides, earthquakes, sinkholes)
    - Anchoring, bracing, shear walls
    - Dewatering sites, agricultural practices
    - Catch basins
  - ✓ Drought
    - Improve water supply (transport/storage/conservation)
    - Remove moisture competitive plants (Tamarisk/Salt Cedar)
    - Water Restrictions/Water Saver Sprinklers/Appliances
    - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
    - Create incentives to consolidate/connect water services
    - Recycled wastewater on golf courses
  - ✓ Wildfire, Grassfires
    - Replacing building components with fireproof materials
    - Roofing, screening
    - Create "Defensible Space"
    - Installing spark arrestors
    - Fuels Modification
  - ✓ Noxious Weeds/Insects
    - Mowing
    - Spraying
    - Replacement planting

- Stop overgrazing
- Introduce natural predators

- Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the naturally beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Wetlands Protection
- Riparian Area/Habitat Protection/Threatened-Endangered Species
- Erosion & Sediment Control
- Best Management Practices
- Dumping Regulations
- Set-back regulations/buffers
- Fuels Management
- Water Use Restrictions
- Landscape Management
- Weather Modification

STRUCTURAL: Projects that have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they "stop" flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Anchoring, grading, debris basins (for landslides)
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection:

- Hazard Maps and Data
- Outreach Projects (mailings, media, web, speakers, displays)
- Library Resources
- Real Estate Disclosure
- Environmental Education

Mitigation Strategy: Action (Implementation) Plan

The mitigation action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered, and incorporated into the community's existing planning mechanism. Each participating jurisdiction must have a mitigation action(s) and an action plan specific to that jurisdiction and its priority hazards and vulnerabilities.

Mitigation Criteria

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLEE

Social: Does the measure treat people fairly? (different groups, different generations)

- Community Acceptance
- Effect on Segment of Population
- Social Benefits

Technical: Will it work? (Does it solve the problem? Is it feasible?)

- Technical Feasibility
- Reduce Community Risk
- Long Term Solution/Sustainable
- Secondary Impacts

Administrative: Do you have the capacity to implement & manage project?

- Staffing
- Funding Allocated
- Maintenance/Operations

Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?

- Political Support
- Local Champion
- Public Support
- Achieves Multiple Objectives
- Supported by a broad array of Stakeholders

Legal: Does your organization have the authority to implement? Is it legal? Are there liability implications?

- Existing Local Authority
- State Authority
- Potential Legal Challenges

Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?

- Benefit of Action
- Cost of Action
- Cost Effective/Economic Benefits
- Economically Viable
- Outside Funding Required

Environmental: Does it comply with Environmental regulations?

- Effect on Land/Water
- Effect on Endangered Species
- Effect on Cultural Resources
- Effect on Hazmat sites
- Consistent with Community Environmental Goals
- Consistent with Environmental Laws
- Environmental Benefits

2. SUSTAINABLE DISASTER RECOVERY

- Quality of Life
- Social Equity
- Hazard Mitigation
- Economic Development
- Environmental Protection/Enhancement
- Community Participation

3. SMART GROWTH PRINCIPLES

- Infill versus Sprawl
- Efficient Use of Land Resources
- Full Use of Urban Resources
- Mixed Uses of Land
- Transportation Options
- Detailed, Human-Scale Design

4. OTHER

- Does measure address area with highest risk?
- Does measure protect …
  - ✓ The largest # of people exposed to risk?
  - ✓ The largest # of buildings?
  - ✓ The largest # of jobs?
  - ✓ The largest tax income?
  - ✓ The largest average annual loss potential?
  - ✓ The area impacted most frequently?
  - ✓ Critical Infrastructure (access, power, water, gas, telecommunications)
- Timing of Available funding
- Visibility of Project
- Community Credibility

Mitigation Action Prioritization Instructions

The committee's brainstormed list of mitigation actions and projects are organized by hazard and posted on flip-chart paper around the room.

You each have 3 sets of colored dots:

- 3 red dots
- 3 blue dots
- 3 green dots

The red dots are for high priority (5 points each)

The blue dots are for medium priority (3 points each)

The green dots are for low priority (1 point each)

Place your dots on the recommendations, using the different colors to indicate your priority. You may use as many of your dots, of any color, on any recommendation --- or you may spread them out using as few of your dots as you wish. The dots will indicate the consensus of the Hazard Mitigation Planning Committee.

Use the list of mitigation selection criteria (above) to help you make your determinations.

Your votes will indicate the consensus of the team.

Santee Sioux Nation – Mitigation Action Worksheet

Agency/Jurisdiction:	
Mitigation Action/Project Title:	
Hazards Addressed:	
Issue/Background:	
Project Description:	
Other Alternatives:	
Existing Planning Mechanism(s) through which Action Will Be Implemented:	
Responsible Office/Partners:	
Cost Estimate:	
Benefits (Losses Avoided):	
Potential Funding:	
Timeline:	
Project Priority (H, M, L):	

Worksheet completed by:	
Name and Title:	
Phone:	

Mitigation Strategy Voting Results

Mitigation Action Title	Hazard Addressed	Votes
Water system	Drought	40
Early warning systems	Flood	34
Water management plan	Drought	31
Mass notifications	Multi-Hazards	29
Public outreach and education	Multi-Hazards	28
Safe rooms and shelters	High Winds and Tornado	24
Undergrounding utilities	Winter Storms	24
Continue monitoring wells	Drought	20
Realign roads and water lines from washouts	Landslide	20
Distribution line between Nio/Santee electricity	Multi-Hazards	20
Generators	Heavy Rains and Storms	17
Hire EM (Complete management plan)	Multi-Hazards	16
Protect water lines from future landslides	Landslide	14
Drought Planning	Drought	12
Update flood management plan	Flood	11
Bank stabilization projects	Flood	11
Generator back-up	Winter Storms	11
Backup generators	Extreme Heat	10
Update EOP	Multi-Hazards	10
Create GIS database	Multi-Hazards	10
Explore areas for cooling centers	Extreme Heat	7
Explore tree maintenance program	Heavy Rains and Storms	5
Continue fuel management	Wildfires	5
Explore green energy plan	Winter Storms	5
Identify vulnerable populations	Multi-Hazards	4
Expansion project	Flood	3
Possibly partnerships with other agencies	Drought	2
Explore NFIP	Flood	2
Anchor system (i.e., Propane Tanks)	Flood	2
Seek to complete actions in the most recent fire plan	Wildfires	2
Explore relationships (i.e., MSAC)	Flood	1
Culvert cleaning/debris issues	Flood	1
Explore defensible space	Wildfires	0

Appendix D Plan Adoption

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region VII, the adoption resolutions will be signed by the Santee Sioux Nation and added to this appendix. A model resolution is provided below.

Resolution # _____

Sample Resolution: Santee Sioux Nation

Resolution # _____

Adopting the Santee Sioux Nation Tribal Hazard Mitigation Plan

WHEREAS the Santee Sioux Nation recognizes the threat that natural hazards pose to people and property within the Santee Sioux Nation;

WHEREAS the Santee Sioux Nation has prepared a multi-hazard mitigation plan in accordance with the Disaster Mitigation Act of 2000 and the requirements in Title 44 Code of Federal Regulations Section 201.7;

WHEREAS the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for the Santee Sioux Nation;

WHEREAS the Plan recommends several hazard mitigation actions and projects that will provide mitigation for specific natural hazards that impact the Santee Sioux Nation, with the effect of protecting people and property from loss associated with those hazards;

WHEREAS adoption of this plan will make the Santee Sioux Nation eligible for funding to alleviate the impacts of future hazards on the Reservation,

NOW THEREFORE BE IT RESOLVED by the Tribal Council of the Santee Sioux Nation that:

1. The Plan is hereby adopted as an official plan of the Santee Sioux Nation.

2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them.

3. Future revisions and plan maintenance required by 44 CFR 201.7 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.

4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Tribal Council, by [insert date] of each calendar year.

5. The Santee Sioux Nation will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR Parts 200 and 3002; and will amend our plan whenever necessary to reflect applicable changes in Tribal or federal laws and statutes.

Passed:_____

(date)

_____

Certifying Official