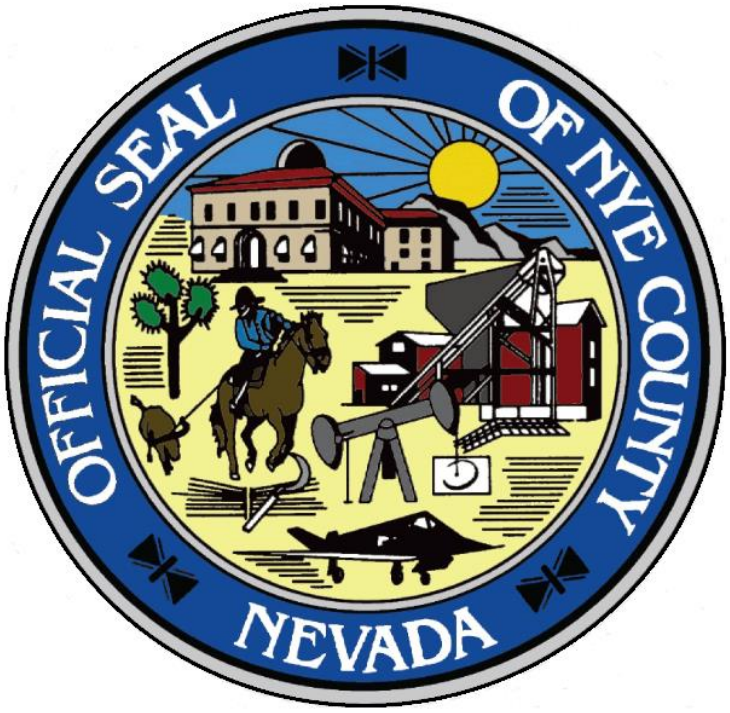

Nye County, Nevada Multi-Jurisdictional Hazard Mitigation Plan

March 2024

Encompassing the Jurisdictions of:
Nye County, Amargosa Valley, the Duckwater Shoshone Nation, Round Mountain, and Tonopah, Nevada

Prepared and submitted by:

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List of Commonly Used Acronyms

Acronym	Meaning
BIA	Bureau of Indian Affairs
BRIC	Building Resilient Infrastructure and Communities
CFR	Code of Federal Regulations
CRS	Community Rating System
DFRIM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
Hazus	FEMA Loss Estimation Software
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Planning
LEPC	Local Emergency Planning Committee
MPC	Mitigation Planning Committee
NCEI	National Centers for Environmental Information
NOAA	National Oceanic and Atmospheric Administration
NRI	National Risk Index
NWS	National Weather Service
NFIP	National Flood Insurance Program
NID	National Inventory of Dams
NVDEM	Nevada Division of Emergency Management
NCOEM	Nye County Office of Emergency Management
PDI	Palmer Drought Index
RL	Repetitive Loss
SRL	Severe Repetitive Loss
SFHA	Special Flood Hazard Area
SPI	Standardized Precipitation Index

Section 1 – Planning Process

1.1 Introduction

Mitigation is commonly defined as sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects. Hazard mitigation planning provides communities with a roadmap to aid in the creation and revision of policies and procedures, and the use of available resources, to provide long-term, tangible benefits to the community. A well-designed hazard mitigation plan provides communities with realistic actions that can be taken to reduce potential vulnerability and exposure to identified hazards.

This Multi-Jurisdictional Natural Hazard Mitigation Plan (HMP) was prepared to provide sustained actions to eliminate or reduce risk to people and property from the effects of natural and man-made hazards. This plan documents Nye County, the Duckwater Shoshone Nation, and participating jurisdictions planning process and identifies applicable hazards, vulnerabilities, and hazard mitigation strategies. This plan will serve to direct available community and regional resources towards creating policies and actions that provide long-term benefits to the community. Local and regional officials can refer to the plan when making decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives.

Specifically, this hazard mitigation plan was developed to:

- Update the December 2013 Nye County, Nevada Hazard Mitigation Plan
- Build for a safer future for all citizens
- Foster cooperation for planning and resiliency
- Identify, prioritize and mitigate against hazards
- Asist with sensible and effective planning and budgeting
- Educate citizens about hazards, mitigation and preparedness
- Comply with federal requirements

Federally approved mitigation plans are a prerequisite for mitigation project grants. Development and Federal Emergency Management Agency (FEMA) approval of this plan will ensure future eligibility for federal disaster mitigation funds through the Hazard Mitigation Grant Program, Building Resilient Infrastructure and Communities, Repetitive Flood Claims, and a variety of other state and federal programs.

In an effort to reduce natural disaster losses, the United States Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). DMA 2000 amended the Stafford Act by repealing the previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). Section 322 of the DMA makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for Federal mitigation grant funds. This HMP was prepared to meet the requirements of the DMA 2000, as defined in regulations set forth by the Interim Final Rule (44 Code of Federal Regulations (CFR) Part 201.6 and CFR Part 201.7).

This plan has been designed to be a living document, a document that will evolve to reflect changes, correct any omissions, and constantly strive to ensure the safety of Nye County's citizens.

1.2 Participating Jurisdictions

All eligible jurisdictions were invited to participate in the organization, drafting, completion, and adoption of this plan. The following Nye County jurisdictions and tribal entities elected to participate in this plan.

- Nye County
- Amargosa Valley
- Duckwater Shoshone Nation
- Round Mountain

- Tonopah

Please note that Beatty, Gabbs, and Pahrump all participated in this planning effort under the county as all are unincorporated cities without elected boards. As such, these jurisdictions will be adopted under the auspices of Nye County.

For any jurisdiction that elected not to participate in this planning effort engagement attempts will continue over the life of this plan in order to encourage future participation.

1.3 Assurances

Nye County and all participating jurisdictions certify that they will comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding and will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes.

This hazard mitigation plan was prepared to comply with all relevant requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended by the DMA 2000. This plan complies with all the relevant requirements of:

- Code of Federal Regulation (44 CFR) pertaining to hazard mitigation planning
- FEMA planning directives and guidelines, including all updated state and local policies for hazard mitigation planning
- Interim final, and final rules pertaining to hazard mitigation planning and grant funding
- Relevant presidential directives
- Office of Management and Budget circulars
- Any additional and relevant federal government documents, guidelines, and rules.

The Duckwater Shoshone Nation certifies that they will comply with all applicable Federal statutes and regulations, including 2CFR Parts 200 and 3002, and will comply with all relevant regulations during the periods for which it receives grant funding. Additionally, the Duckwater Shoshone Nation will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes.

1.4 Adoption Resolutions

Upon review and approved pending adoption status by FEMA Region IX, adoption resolutions will be signed by the participating jurisdictions. FEMA approval documentation may be found in Appendix A. Jurisdictional adoption resolutions may be found in Appendix B.

1.5 2023 Plan Update

In 2023 Nye County, Duckwater Shoshone Nation, and participating jurisdictions began the process to update the 2013 Nye County HMP. It was determined that Nye County Office of Emergency Management's (NCOEM) Director would serve as the project manager, directing this plan update and acting as the primary point-of-contact throughout the project. The Director's primary roles included:

- Coordinating meetings and interviews
- Collecting data for the consultants to utilize
- Reviewing deliverables
- Monitoring the overall development of the plan

Nye County contracted with BOLDplanning to assist in updating their HMP. BOLDplanning's primary roles included:

- Ensure that the hazard mitigation plan meets all regulatory requirements
- Assist with the determination and ranking of hazards
- Assist with the assessment of vulnerabilities to identified hazards

- Assist with capability assessments
- Identify and determine all data needs and solicit the information from relevant sources
- Assist with the revision and development of the mitigation actions
- Development of draft and final planning documents

The Nye County HMP has undergone significant revision and upgrading since its last edition. Not only has the county made significant efforts to improve the functionality and effectiveness of the plan itself, but it has significantly improved its hazard mitigation program. Additionally, the level of analysis and detail included in this risk assessment is greater than the previous edition of the plan. This grants all participating jurisdictions a better base to further mold and improve its mitigation strategy over the next five years.

As part of this planning effort, each section of the previous mitigation plan was reviewed and completely revised. The sections were reviewed and revised against the following elements:

- Compliance with the current regulatory environment
- Completeness of data
- Correctness of data
- Capability differentials
- Current state environment

During this process, and after a thorough review and discussion with all participating jurisdictions and stakeholders, it was determined that the priorities of the overall community in relation to hazard mitigation planning have not changed during the five years of the previous planning cycle.

While the Nye County hazard mitigation program has matured over the years, an unfortunate lack of funding and grant opportunities has prevented the completion of any major hazard mitigation projects (with the exception of Nye County Ordinance 514 mandating water conservation). As such, this revised plan reflects the static state of proposed mitigation actions.

1.6 Planning Process

Nye County, the Duckwater Shoshone Nation, and participating jurisdictions undertook the following steps to update and create a robust HMP:

- Review of the 2013 HMP
- Review of current related planning documents
- Delivery of organizational and planning meetings
- Solicitation of public input as to plan development
- Assessment of potential risks
- Assessment of vulnerabilities and assets
- Development of the mitigation actions
- Development of a draft multi-hazard mitigation plan
- Implementation, adoption, and maintenance of the plan

The process established for this planning effort is based on DMA 2000 planning and update requirements and the FEMA associated guidance for hazard mitigation plans. The FEMA four step recommended mitigation planning process, as detailed below, was followed:

1. Organize resources
2. Assess risks
3. Develop a mitigation plan
4. Implement plan and monitor progress

To accomplish this, the following planning process methodology was followed:

- Inform, invite, and involve other mitigation plan stakeholders throughout the state, including federal agencies, state agencies, regional groups, businesses, non-profits, and local emergency management organizations.
- Conduct a thorough review of all relevant current and historic planning efforts
- Collect data on all related state and local plans and initiatives. Additionally, all related and relevant local plans were reviewed for integration and incorporation.
- Develop the planning and project management process, including methodology, review procedures, details about plan development changes, interagency coordination, planning integration, and the organization and contribution of stakeholders.
- Develop the profile of the county and participating jurisdictions.
- Complete a risk and vulnerability assessment using a Geographic Information System (GIS) driven approach using data from the Nye County, the State of Nevada, FEMA, and other federal and state agency resources. Analyses were conducted at the county and jurisdictional level.
- Develop a comprehensive mitigation strategy effectively addressing their hazards and mitigation program objectives. This included identifying capabilities, reviewing pre and post disaster policies and programs, identifying objectives and goals, identifying mitigation actions and projects, and assessing mitigation actions and projects.
- Determination and implementation of a plan maintenance cycle, including a timeline for plan upgrades and improvements.
- Submission of the plan to FEMA for review and approval and the petition of all participating jurisdictional governments for a letter of formal plan adoption.

1.7 Mitigation Planning Committee

Project initiation began with a selection and meeting of the primary stakeholders to establish the Mitigation Planning Committee (MPC). The core members of the MPC then established and wrote the projects operating procedures, established expectations, solidified the plan development timeline, and created project milestones. Additionally, the team reviewed and discussed how the plan would incorporate FEMA requirement and other emergency management planning efforts. The following participants were selected for the MPC:

Table 1: Mitigation Planning Committee

MPC Member	Title	Jurisdiction
Scott Lewis	Director of Emergency Management	Nye County
Patrick Lazenby	Emergency Management Administration	Nye County
Carolyn Allen	Chair, Town Board	Amargosa Valley
Erika Gerling	Beatty Town Advisory Board	Beatty
Kenneth House	Gabbs Town Advisory Board	Gabbs
Tim Sutton	Town of Pahrump and Nye County Manager	Pahrump
Nicole Silberschlag	Chair, Town Board	Round Mountain
Don Kaminski	Chair, Town Board	Tonopah
Marian Perez	Emergency Manager	Duckwater Shoshone Nation

Each MPC member was thoroughly interviewed regarding their jurisdiction's mitigation related activities. These interviews were invaluable in fully integrating the resources necessary to produce this plan, document mitigation activities, and document the mitigation resources available to better increase resiliency.

In general, all MPC members were asked to participate in the following ways:

- Attend and participate in meetings
- Assist with the collection of data and information

- Review planning elements and drafts
- Integrate hazard mitigation planning elements with other planning mechanisms
- Facilitate agency coordination and cooperation
- Assist with the revision and development of mitigation actions

MPC members who were unable to attend meetings due to budgetary or personnel constraints were contacted via email or phone to discuss hazard mitigation planning, including the process, goals, mitigation actions, local planning concerns and plan review.

1.8 Hazard Mitigation Planning Equity

Planning equity refers to the principle of fairness and justice in planning and development processes. It emphasizes the equitable distribution of resources, opportunities, and benefits among all members of a community, particularly those who have historically been marginalized or disadvantaged. The concept of planning equity recognizes that planning decisions can have significant impacts on different groups of people and aims to ensure that these decisions promote social justice and inclusivity. It involves addressing spatial inequalities, such as disparities in access to housing, transportation, public services, green spaces, and employment opportunities.

Planning equity entails involving diverse stakeholders in decision-making processes, including community members, advocacy groups, and underrepresented populations. It seeks to empower marginalized communities by giving them a voice in shaping the development and planning policies that directly affect their lives.

Planning equity and hazard mitigation planning are closely related, as both aim to create more resilient and inclusive communities. As part of this planning effort, the following intersections were considered between planning equity and hazard mitigation planning:

- Vulnerability assessment: Planning equity recognizes that certain communities, particularly marginalized and disadvantaged populations, may be more vulnerable to hazards due to social, economic, and environmental factors. When conducting a vulnerability assessment as part of hazard mitigation planning, it is important to consider equity issues and identify areas or groups that may experience disproportionate impacts.
- Engaging marginalized communities: Planning equity emphasizes the inclusion and participation of diverse stakeholders, including marginalized communities, in decision-making processes. In hazard mitigation planning it is crucial to engage these communities to understand their unique needs, concerns, and perspectives regarding hazards.
- Addressing social disparities: Hazard mitigation planning can help address social disparities by considering the unequal distribution of resources and opportunities in the context of hazards. This can involve implementing mitigation measures that specifically target vulnerable populations, such as affordable housing in safer areas or improved access to emergency services and transportation for underserved communities.
- Equitable distribution of resources: Planning equity promotes the equitable distribution of resources, and this principle can be applied to hazard mitigation planning. It involves ensuring that mitigation measures and investments are allocated fairly, with consideration given to communities that have historically received less attention or investment. This can help reduce existing disparities and enhance the resilience of marginalized communities.

By integrating planning equity into hazard mitigation planning, it becomes possible to develop strategies and actions that not only reduce the risks associated with hazards but also promote social justice, inclusivity, and resilience for all members of the community.

Marian Perez, the Emergency Manager of the Duckwater Shoshone Tribe, identified as a historically underserved community, was invited to be part of the planning process and an MPC member. No other Tribal representatives attended any formal meetings

1.9 Plan Participation

All eligible jurisdictions were invited to participate in the organization, drafting, completion and adoption of this plan. Invited jurisdictions included, but were not limited to, elected officials, relevant State of Nevada agencies, counties, cities, school districts, non-profit agencies, planning equity partners, and businesses.

In order to have an approved hazard mitigation plan, DMA 2000 requires that each jurisdiction participate in the planning process. Each jurisdiction choosing to participate in the development of the plan were required to meet detailed participation requirements, which included the following:

- When practical and affordable, participation in planning meetings
- Provision of information to support the plan development
- Identification of relevant mitigation actions
- Review and comment on plan drafts
- Formal adoption of the plan (unless covered under Nye County Adoption due to the lack of elected boards)

Based on the above criteria, the following jurisdictions participated in the planning process and will adopt the approved hazard mitigation plan:

Table 2: Adopting Jurisdictions

Jurisdiction	Participation Requirements Met	Representative	Title
Nye County	Yes	Scott Lewis	Director of Emergency Management
Nye County	Yes	Patrick Lazenby	Emergency Management Administration
Amargosa Valley	Yes	Carolyn Allen	Chair, Town Board
Round Mountain	Yes	Nicole Silberschlag	Chair, Town Board
Tonopah	Yes	Don Kaminski	Chair, Town Board
Duckwater Shoshone Nation	Yes	Marian Perez	Emergency Manager

The Nye County MPC provided the opportunity for additional HMP stakeholders, including agencies involved in regulating and overseeing development, neighboring communities, agencies, businesses, academia, non-profits, and other interested parties to be involved in the mitigation planning process. Stakeholders were notified of the process through direct communication with the Nye County HMP project manager, Nye County website notices, and advertisements in local media.

As recommended in FEMA's "Guide to Expanding Mitigation" Nye County took a whole community approach to this planning effort, including:

- Inviting historically underserved populations to participate in the planning and decision-making processes
- Inviting faith based and community organizations, nonprofit groups, schools, and academia, and tribal partners to be plan stakeholders

As a result of this effort, conducted by NCOEM through personal outreach and through Nye County website notices and local media advertisements, the Duckwater Shoshone Tribal Nation engaged into participating in this plan. No other agencies representing underserved communities were identified in Nye County, Amargosa Valley, Pahrump, or Round Mountain.

Local building departments played a critical role in creating and reviewing this HMP. Their expertise was used to help identify local vulnerabilities and develop building-related mitigation measures (please see section 5.3)

Jurisdictional NFIP coordinators played a key role in mitigation planning at the community level. These coordinators were actively engaged and for their expertise on flood risk, mitigation strategies, and NFIP compliance (please see Section 5.4).

As part of the planning process, emergency managers from neighboring Nevada counties were personally invited to attend public meetings. Invited emergency managers include:

- Esmerelda County: Paul Melendrez
- Mineral County: Patrick Hughes
- Churchill County: Mike Heidemann
- Lander County: Roger Unger
- Eureka County: Jeb Rowley
- White Pine County: Brett North
- Lincoln County: Eric Holt
- Clark County: Cheryl Nagy
- Inyo County, California: Mikaela Torres
- Nevada National Security Site (within Nye County): John Lombard

Additionally, due to the large footprint of the Nellis Air Force Range within the county, an invitation was extended to Colonel Jason Wild, Vice Commander, 99th Air Base Wing.

Of the emergency managers and Nellis Air Force Range personnel invited, only Clark, Eureka, and White Pine Counties elected to attend.

Finally, representatives from the Nevada Division of Emergency Management (NVDEM) and FEMA Region IX were invited to planning meetings.

The following table represents plan stakeholders:

Table 3: HMP Stakeholders

Name	Representing	Title
Erika Gerling	Beatty	Advisory Board Chair
Kenneth House	Gabbs	Advisory Board Chair
Timothy Sutton	Pahrump	Town Manager
Janell Woodward	NVDEM	State Hazard Mitigation Officer
Heather Lafferty	NVDEM	D.E.I./AFN Coordinator
Frank Carbone	Nye County	Commissioner
Arnold Knightly	Nye County	Public Information Officer
Anthony Perchetti	Belmont Town Advisory Board	Chair
Carolyn Drayon	Railroad Valley Advisory Board	railroadvalleyboard@gmail.com
Dan Berc	National Weather Service Las Vegas	Warning Coordination Meteorologist

Any jurisdiction not covered in this HMP is either covered under another plan or declined to participate.

1.10 Project Timeline

The following represents the HMP project timeline:

Chart 1: Project Timeline

1.11 Planning Meetings

The Nye County MPC held various public meetings to discuss the mitigation planning process as well as gain public support and input for the plan update. The following is a brief synopsis of those meetings.

- **HMP Update Kick-Off and Public Information Meeting – March 10, 2023:** BOLDplanning hosted a kick-off meeting for Nye County HMP stakeholders and the public. Prior to the meeting, a public announcement was published in the local newspaper and on participating jurisdiction websites. At the meeting, MPC members, plan stakeholders, and the public were invited to voice any concerns, ask questions, and provide input on the mitigation plan update. Additionally, BOLDplanning worked with MPC members and plan stakeholders to collect contact information, hazard history, facility information, and other pertinent jurisdictional information.
- **HMP Update Final Review Meeting – October 23, 2023:** BOLDplanning hosted a public final plan review meeting for the Nye County HMP. Prior to the meeting, a public announcement was published in the local paper and on the participating jurisdiction websites. At the meeting, MPC members, plan stakeholders, and the public were invited to voice any concerns, ask questions, and provide input on the mitigation plan update. Additionally, members of the public were invited to review a draft copy of the Nye County HMP update posted to NCOEM's website for two weeks prior to the final meeting, and prior to its submission to NVDEM.

Other planning events included conference phone calls with participating jurisdiction officials who could not attend scheduled meetings. No other formalized meetings were held by either the MPC of jurisdictional representatives.

Additionally, there were monthly situation reports and calls provided to Nye County and its participating jurisdictions to provide updates concerning the phases of plan development. These situation report calls were issued and held at the beginning of each month and were facilitated by BOLDplanning.

1.12 Community Involvement

As part of the overall planning process, members of the community (the public) were provided with numerous opportunities to contribute and comment on the creation and adoption of the plan. For participating non-tribal jurisdictions, the public was defined as any person with an interest in the resilience and welfare of Nye County. For the Duckwater Shoshone Nation, the public was defined as any member of the Duckwater Shoshone Nation, or any person with a vested interest in the welfare and wellbeing of the Duckwater Shoshone Nation and the county as a whole. These opportunities included:

- Advertised meeting invitations
- Comment period upon completion of draft plan
- Online survey

The public, and members of the Duckwater Shoshone Nation, were notified of open meetings via participating jurisdiction and Tribal websites and print media. Further, an online HMP survey was created for Nye County. The Nye

County, NV Hazard Mitigation Plan Update Survey (https://publicinput.com/e5822) allowed all plan stakeholders and the public to provide feedback and input on the HMP update prior to its submission to NVDEM and FEMA. Comments from this survey are included in Appendix C.

Input from the general public provided the MPC with a clearer understanding of local concerns, helped confirm identified hazards, helped shape proposed mitigation actions, and provided elected and Tribal officials with a guide and tool to set local, regional, and Tribal ordinances and regulations. This public outreach effort was also an opportunity for adjacent jurisdictions and entities to be involved in the planning process. Additionally, as citizens were made more aware of potential hazards and the local process to mitigation against their impacts, it was believed that they would take a stronger role in making their homes, neighborhoods, schools, and businesses safer from the potential effects of natural hazards.

Section 2 – Plan Documentation, Development, and Maintenance

2.1 Planning Document Resources

The hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various other jurisdictional plans. In creating this plan, all the planning documents identified below were consulted and reviewed, often extensively. In turn, when each of these other plans is updated, they will be measured against the contents of the hazard mitigation plan.

Below is a list of the various planning efforts, sole or jointly administered programs, and documents reviewed and included in this hazard mitigation plan. While each plan can stand alone, their review and functional understanding was pivotal in the development of this plan and further strengthens and improves Nye County's resilience to disasters.

- **Nye County 2013 Hazard Mitigation Plan**
  The previous HMP has been reviewed and is incorporated throughout this plan per FEMA requirements.
- **Nye County Critical Facilities List, 2023**
  The MPC compiled a list of critical facilities and pertinent information on those facilities. This list is used throughout the plan and is the basis for the vulnerability assessments and loss estimates. The complete list is posted in Appendix D.
- **Nye County Comprehensive Emergency Operations Plan**
  NCOEM developed this plan to develop procedures for the protection of personnel, equipment, and critical records and to help establish policies that ensure the continuity of government and essential services during and after disasters.
- **Nye County Earthquake Hazards and Seismic Risk Study, 2021:**
  This study was used to inform earthquake hazard data.
- **Pahrump Regional Planning District Master Plan, 2014**
  This plan sets policies that help the county address critical issues facing the community, achieve goals based on priority, and coordinate public and private efforts for mutual success. It also provides the historical context, background and current data necessary to understand issues and choose solutions as well as seek various forms of funding.
- **Pahrump Regional Planning District Ordinance #302**
  Mandates that all impact fees collected must be deposited in an interest-bearing account which clearly identifies the category of capital improvements or facility expansions within the service area for which the fee was imposed; and other matters properly related thereto.
- **Nye County and Participating Jurisdiction Planning and Zoning Documents and Ordinances**
  Nye County and participating jurisdictions provided a host of planning, zoning, and development related documents. These documents were reviewed, assessed, and cataloged to compile each participating jurisdiction's capabilities.
- **Duckwater Shoshone Tribal Code**
- **Duckwater Shoshone Sustainability Plan**
  Plan details the approach the Nation will take towards continued renewable energy community development,
- **Duckwater Shoshone Master Plan Update, 2012**
  The plan sets policies that help the Nation support and guide infrastructure growth and economic sustainability. It also provides the historical context, background and current data necessary to understand issues and choose solutions as well as seek various forms of funding.
- **State of Nevada Hazard Mitigation Plan, 2018**
  This plan set a baseline for standards and practices for hazard mitigation planning and was used as a resource for information and data.

Information from each of these plans and programs is utilized within the applicable hazard sections to provide data and fully inform decision making and prioritization.

2.2 Technical Resources

The Nye County MPC employed a variety of technical resources in its plan development. These technical resources were instrumental in completing an accurate vulnerability and risk assessment.

- **BOLDplanning Inc.:** With over 18 years of experience in hazard mitigation planning, BOLDplanning was the principal plan writer.
- **ESRI ArcGIS v10:** Assisted with the development of maps for this plan, along with the HAZUS® models.
- **FEMA Digital Flood Insurance Rate Maps (DFIRM**s): FEMA's National Flood Hazard Layer data was instrumental in mapping floodplain locations and estimating potential flood impacts and loss estimates.
- **FEMA National Risk Index (NRI):** An online mapping application that identifies communities most at risk to natural hazards. The mapping service visualizes natural hazard risk metrics and includes data about expected annual losses from natural hazards, social vulnerability, and community resilience. The NRI's interactive web maps are at the county and Census tract level and made available via geographic information system services for custom analyses.
- **National Oceanic and Atmospheric Administration (NOAA)/National Centers for Environmental Information (NCEI):** Weather data and historical events were primarily provided by NCEI.

In addition, relevant federal, regional, state, local, and any private and non-profit entities were also invited to provide input and utilized for information and technical expertise. The following table indicates these entities:

Table 4: Technical Input Agencies

Agency	Entities	Data Input
Federal Agencies	Bureau of Indian Affairs (BIA), National Parks, NOAA, U.S. Department of Agriculture National Resources Conservation Service, U.S. Geological Survey (USGS), National Weather Service (NWS)	Provided weather data, dam data, land use data, and geological data
State Agencies	NVDEM, Nevada Department of Natural Resources	Provided oversight and technical assistance; provided hazard records
Local Governments	Nye County Emergency Management, Duckwater Shoshone Nation, Participating Jurisdictions	Provided input as MPC members / principal subjects
Private Organizations	BOLDplanning	Directed planning effort as principal planners

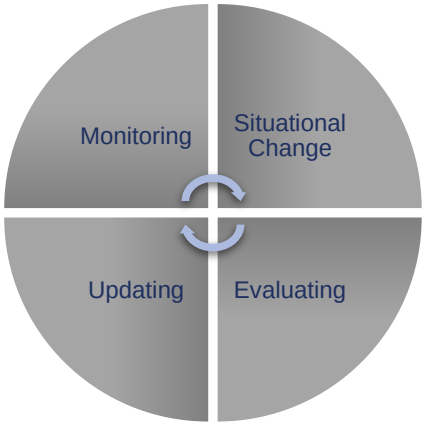
2.3 Plan Maintenance Responsibilities

NCOEM will serve as the lead coordinating agency for plan maintenance. Additional assistance in the plan maintenance process is provided by members of the MPC, the Duckwater Shoshone Nation, subject matter experts, and representatives of local jurisdictions.

NCOEM and the MPC will facilitate the review and revision of the HMP every five years. The review and revision will be an ongoing process. This process will incorporate all of the revisions made during the life of the plan, especially new data obtained from participating jurisdictions.

2.4 Plan Maintenance Process

The Nye County MPC has developed a method to ensure monitoring, evaluation, and updating of its mitigation plan. Upon adoption of the Nye County HMP update, NCOEM will utilize its Local Emergency Planning Committee (LEPC) to provide plan updates, revisions, and data collection for future HMP planning purposes. The LEPC chair will form a subcommittee for proposed mitigation projects comprised of NCOEM's director, the Duckwater Shoshone Nation Emergency Manager, and jurisdictional representatives from the MPC. The chair of the subcommittee will be determined by a vote in the subcommittee. Additional members may be added based on necessity. The sub-committee will submit a regular report to the LEPC, which in turn, will submit a report to NCOEM and the Duckwater Shoshone Nation. The Nye County HMP Update Report is as follows:



Local Emergency Planning Committee
Multi-Jurisdictional Natural Hazard Mitigation Plan
Evaluation Report

Pre-Disaster Mitigation Plan Sub-Committee Chair: _____
Meeting Date: _____
Plan Approval Date:_____
Plan Expiration Date: _____
Have there been any disasters or training event since the last report? If so, list them below:

Disaster Number/ Training Event	Hazard Type(s)	Was the hazard expected or unforeseen?	Is a plan update required?
Example: DR-1000	*Volcanic Eruption*	*Unforeseen*	*Yes*
Example: Annual Training	*Flash Flooding*	*Expected*	*No*

Mitigation Projects:

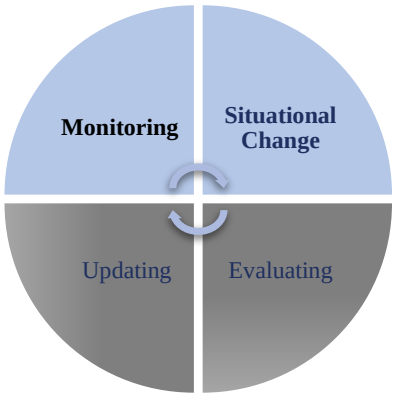
Mitigation Project	Participating Jurisdictions	Proposed/Scheduled /In Progress/ Completed	Behind/Ahead/ On-Schedule	Estimated Completion Date
Example: Tornado Safe Room	*Cash*	*In Progress*	*On-Schedule*	*1/1/2021*

Miscellaneous Notes:

NCOEM may request a non-scheduled report on the monitoring, evaluation, or updating of any portion of the HMP due to irregular progress on mitigation actions and or projects, in the aftermath of a hazard event, or for any reason deemed appropriate.

Plan Monitoring and Situational Change

Plan monitoring can be defined as the ongoing process by which stakeholders obtain regular feedback on the progress being made towards achieving their goals and objectives. In the more limited approach, monitoring may focus on tracking projects and the use of the agency's resources. In the broader approach, monitoring also involves tracking strategies and actions being taken by partners and non-partners, and figuring out what new strategies and actions need to be taken to ensure progress towards the most important results.



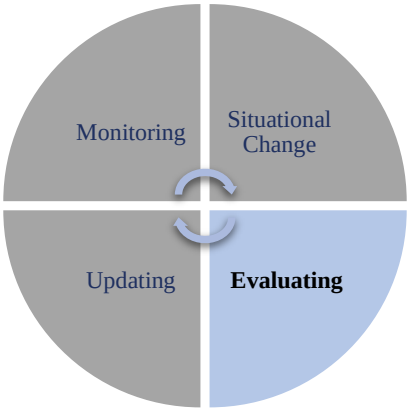
A monitoring report will be written and submitted for review to the LEPC and after the annual MPC meeting or when triggered by situational change. The monitoring report answers the following questions:

- Is the mitigation project under, over, or on budget?
- Is the mitigation project behind, ahead of, or on schedule?
- Are there any changes in jurisdictional capabilities?
- Are there any changes in hazards?
- Has the mitigation action been initiated, or its initiation planned?
- Is the current process of prioritizing mitigation actions and projects appropriate and accurate?
- Has the current method of incorporating mitigation actions and projects yielded a comprehensive action and project strategy to address seen and unforeseen hazards?
- If applicable, has participation in a mitigation action's collaboration been regular?
- Was a negative result caused directly or indirectly by insufficient levels of public outreach?
- If any, what plan updates occurred, why they occurred, and what is their impact?

The plan maintenance process is cyclical and maintenance items can operate simultaneously within the process.

Plan Evaluation

A plan evaluation is a rigorous and independent assessment of either completed or ongoing activities to determine the extent to which they are achieving stated objectives and contributing to decision making.



An evaluation report will be written and submitted to Nye County's LEPC when the situation dictates.

The following situations are typical examples of when an evaluation will be necessary.

- Post hazard event
- Post training exercise
- Post tabletop or drill exercise
- Significant change or completion of a mitigation project
- Significant change or completion of a mitigation action

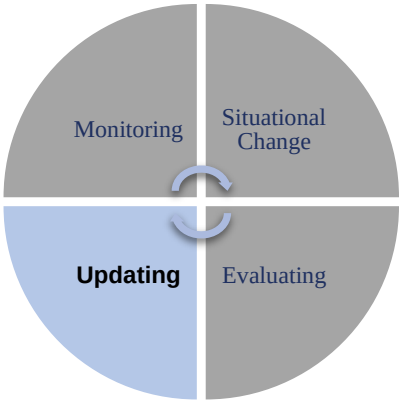
An evaluation report will ask the following questions in response to the previously listed events.

- Do the mitigation objectives and goals continue to address the current hazards?
- Are there new or previously unforeseen hazards?
- Does a change in hazard vulnerability demand a change of or addition of mitigation actions or projects?

- Does a change in the mitigation strategy demand a change of or addition of mitigation actions or projects?
- Are current resources appropriate for implementing a mitigation project?
- Was the outcome of a mitigation action/project expected?
- Are there implementation problems?
- Was the public engaged to the point where they were satisfied with current engagement strategies?
- Did the public participate in a number that produced a positive yield on the plan, action, or project?
- Are there coordination problems?

Plan Updates

Typically, the updating of a HMP is initiated upon the completion of a plan evaluation and even then, only when the evaluation determines an update is appropriate. A plan update also occurs every five years per FEMA guidelines. Additionally, when new hazard data becomes available it will be added to the HMP. New data will be confirmed or denied at annual MPC meetings. Additionally, a HMP update can be written any time it is deemed necessary by NCOEM.



According to FEMA DMA 2000 guidelines for mitigation planning, Nye County will begin the update process three years from this plan's adoption. It will do so under the direction of the County's Emergency Management Director. NCOEM will coordinate and facilitate a bi-annual meeting within the five-year cycle with stakeholders from participating jurisdictions and stakeholders from neighboring counties.

These meetings will allow NCOEM, the MPC Chair, MPC members, and stakeholders to gather relevant information needed for the next plan update. These meetings will ensure the appropriate status of certain goals (mitigation activities and projects) identified in mitigation strategy are up to date to include in the next FEMA-required, five-year plan update.

The following indicates the tasks to be performed during this plan update period:

- **2026 Fall Meeting:** The MPC will begin updating the risk assessment portion of the plan. Hazards will be analyzed to determine if they are still relevant, if location should be updated, and if new hazards should be added. Previous occurrences will be reviewed to help determine the probability of future events.
- **2027 Spring Meeting:** The MPC will begin updating the vulnerability assessment. The MPC will update the vulnerability assessment portion of the plan. Data will need to be gathered for assets, critical facilities, building stock values, jurisdictional damages, etc.
- **2027 Fall Meeting:** The MPC will review information received and determine if the goals and objectives are still relevant and if new ones should be added. Actions will be reviewed to determine if they should remain in the plan, have been completed, or are no longer relevant. The MPC will review the potential funding sources for each action.
- **2028 Spring Meeting:** The MPC will evaluate the policies, programs, capabilities, and funding sources from the previous plan to determine if they are still accurate and if any new items should be added.
- **2028 Fall Meeting:** The MPC will review the draft copy of the mitigation plan and make comments and updates if necessary. Formal submittal to FEMA for re-approval will follow.

In general, the following steps will be taken to complete the next HMP revision:

- Evaluate and update the planning process.
- Review the stakeholder contact list and identify new stakeholders.
- Initiate plan outreach and discussion, including a stakeholder meeting.

- Consider the addition, removal, or modification of hazards identified in the plan.
- Update and revise membership of the MPC.
- Evaluate risk assessment methodologies and data sources.
- Evaluate and update critical facility inventory information.
- Evaluate and update the hazard profiles.
- Evaluate and update the risk assessment summary.
- Evaluate and update the mitigation strategy.
- Evaluate and update the mitigation implementation system.
- Evaluate and update the plan maintenance.
- Integrate new and updated local and tribal mitigation plans.
- Integrate new and updated related local plans.
- Evaluate and update other plans sections.
- Identify and add any additional sections or information needed.
- Review updated plan in its entirety.
- Conduct updated plan outreach, including public information, comment period, and meetings.
- Integrate additional comments received.
- Finalize plan document.
- Complete crosswalk and submit final plan to FEMA for review and approval.
- Make additional modifications as required.
- Obtain jurisdictional adoption resolutions.

Plan Update Responsibilities

NCOEM and the Duckwater Shoshone Nation Emergency Manager serve as the lead coordinators for HMP maintenance. NCOEM and the Duckwater Shoshone Nation Emergency Manager will facilitate the review and revision of the HMP every five years. Additionally, NCOEM and the Duckwater Shoshone Nation Emergency Manager will continuously seek to expand participation in the mitigation planning process.

2.5 HMP Incorporation and Integration

The hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various county, tribal, and local plans. Unfortunately, previous versions of the Nye County HMP have not been incorporated into jurisdictional planning efforts. Under the leadership of the MPC, it is hoped that when future revisions occur to these other plans, they will be measured against the contents of this HMP. Plan integration will help:

- Align community goals, objectives, and prime concerns
- Avoid lost opportunities
- Eliminate duplication of effort

In cooperation with the MPC, each participating jurisdiction will be actively courted on incorporating elements of this hazard mitigation plan for any relevant plan, code or ordinance revision or creation. Each participating jurisdiction has committed to actively encourage all departments to implement actions that minimize loss of life and property damage from hazards. Whenever possible, each participating jurisdiction will use existing plans, policies, procedures, and programs to aid in the implementation of identified hazard mitigation actions. Potential avenues for implementation may include:

- Operation plans
- General or master plans
- Ordinances
- Capital improvement plans

- Budget revisions or adoptions
- Stormwater planning
- Land use planning
- Tribal codes

Specific areas identified for integration include:

- Capital Improvement Plan Streets and Highways FY 2006-2015: On the next update, integrate identified hazard data and mitigation projects from the HMP.
- 2023 Pahrump Regional Planning District Master Plan: On the next update, integrate identified population data, hazard data and mitigation projects from the HMP.
- Duckwater Shoshone Master Plan Update, 2012: On the next update, integrate identified population data, hazard data and mitigation projects from the HMP.

Plan incorporation and integration is crucial for creating a cohesive and coordinated approach to address various aspects of hazard mitigation. All stakeholders and participating jurisdictions utilize similar internal procedures for plan incorporation and integration. The following represent commonly utilized methods by all participating jurisdictions

- Cross-Referencing: Identify and cross-reference relevant sections of different plans and policies. This involves explicitly noting connections between the goals, strategies, and actions outlined in one plan with those in others.
- Consistency Checks: Conduct consistency checks to ensure that the language, objectives, and strategies in different plans and policies align with each other.
- Joint Planning Committees: Establish joint planning committees or task forces that involve representatives from different departments or agencies responsible for various plans (for example, the MPC). These committees facilitate communication, collaboration, and the coordination of planning efforts across sectors.
- Collaborative Workshops and Meetings: Organize collaborative workshops and meetings to bring together stakeholders involved in different planning processes (as seen in the planning meetings for the HMP). These forums provide an opportunity for stakeholders to share information and discuss common goals.
- Alignment with State and Regional Plans: Ensure that local plans align with broader regional and state plans. This involves considering regional and state priorities and incorporating them into local planning efforts to create a harmonized approach to development.
- Data Sharing and Analysis: Share relevant data among planning efforts and conduct joint data analysis. This helps in creating a common understanding of the challenges and opportunities, facilitating evidence-based decision-making across different plans.
- Unified Implementation Strategies: This involves identifying common actions and initiatives that contribute to the achievement of multiple goals outlined in various plans.

All participating jurisdictions within Nye County have good working relationships with both each other, the State of Nevada, and FEMA, indicating great potential for plan incorporation and integration across the planning area. Where appropriate, NCOEM and Duckwater Shoshone Nation will take the lead in integrating this HMP into overarching plans, codes, ordinances and any other relevant documents, policies, or procedures.

The Duckwater Shoshone Nation had no active programs on initiatives with FEMA during the updating of the HMP. However, any future FEMA programs and initiatives will utilize this HMP for data and guidance, as relevant.

2.6 Continued Public Involvement

Nye County and all participating jurisdictions are dedicated to involving the public in the continual shaping of the HMP and in the development of its mitigation projects and activities. The Nye County MPC will continue to keep the public informed about its hazard mitigation projects and activities through NCOEM's website. The public will also be invited

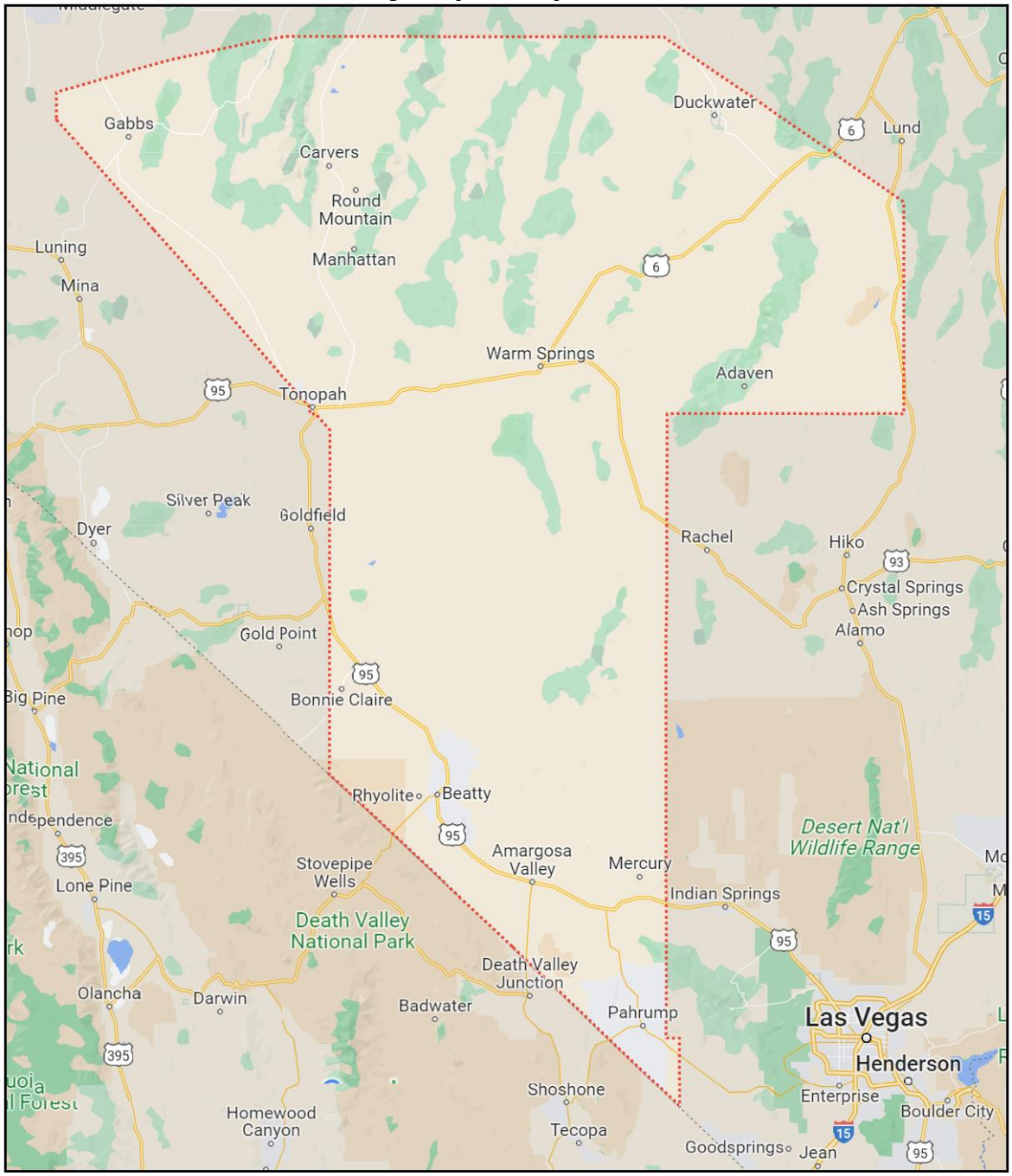
to participate in regular MPC meetings to review and discuss the mitigation-related events of the past year. Additionally, participating jurisdictions will present to public officials in a public forum concerning the progress of mitigation actions identified in this plan as progress is made. Copies of the Nye County HMP will be available online at NCOEM website, the Duckwater Shoshone Nation website, and distributed to all the participating jurisdictions and made available to the public.

Section 3 – Planning Area

3.1 Introduction to the Planning Area

Nye County is located in the south-central portion of the State of Nevada and is the largest of the State's 17 counties at 18,181 square miles. Nye County is bordered by Churchill, Lander, Eureka, and White Pine counties to the north; Mineral and Esmeralda Counties to the west; Lincoln and Clark Counties to the east; and Inyo County, California, to the south. Elevations within the county range from 11,773 feet at Arc Dome to 2,650 feet at Pahrump. The northern portion of the county has numerous mountain ranges including the Toiyabe Range, the Monitor Range, the Hot Creek Range, and the Grant Range. Jurisdictions within the county include Amargosa Valley, Beatty, Gabbs, Pahrump, Round Mountain and Tonopah. The following maps detail the Nye County planning area and participating jurisdictions.

Map 1: Nye County, Nevada

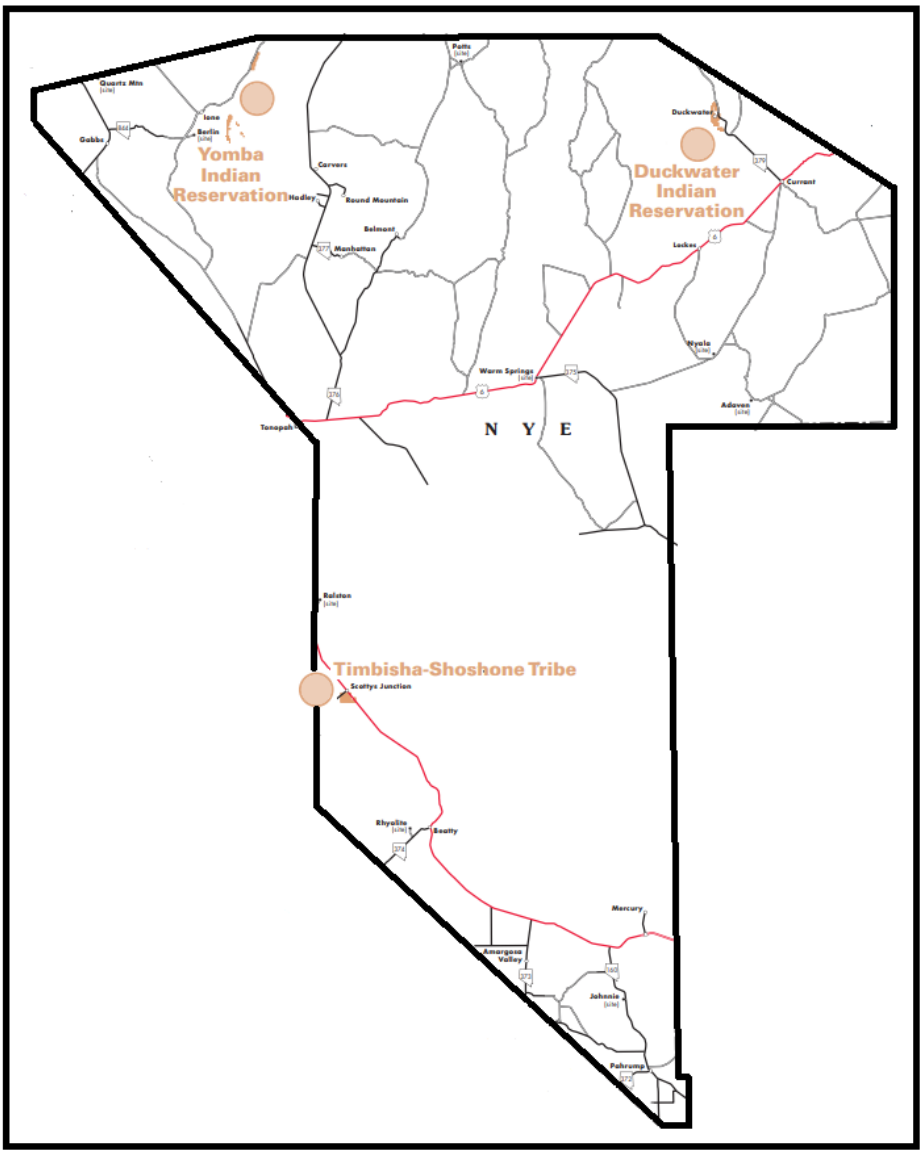


3.2 Tribal Reservations

Located in a high desert valley in northern Nye County, Nevada, the Duckwater Shoshone Tribe sits in the beautiful Railroad Valley, near the Big Warm Spring. The Duckwater Shoshone Tribe is a federally recognized tribe of the Western Shoshone and is governed by a five-member tribal council. The reservation was established in 1940, when the tribe purchased the 3,272-acre Florio Ranch. The reservation is now comprised of approximately 3,815 acres of land.

The following map details the location of tribal reservations within Nye County. Of the three Tribal Nations, only the Duckwater Shoshone Nation elected to participate in this plan.

Map 2: Tribal Reservations, Nye County, Nevada



3.3 Demographics

In general, Nye County is dominated by one large urban area (Pahrump) with small population centers throughout the remainder of the County. In addition, three Tribal Nations are present in the county. Of the 17 counties in the State of Nevada, Nye County is ranked as number one in land area and number seven in population size. Data from the United States Census Bureau in the tables below details the participating jurisdictions' demographic information:

Table 5: Population Data

Jurisdiction	Land Area (Sq. Mi.)	Population			Percentage Population Change 2010-2020	Population Density
		2000	2010	2020		
Nye County	18,181	32,485	43,496	51,591	18.6%	3
Amargosa Valley	480	933	1,262	1,064	(-15.7)%	2
Beatty	17.7	920	795	762	(-4.2)%	43
Gabbs	1.5	318	296	186	(-41.5)%	124
Pahrump	364	24,631	36,441	44,738	22.8%	123
Round Mountain	1.7	1,944	1,577	933	(-40.8)%	549
Tonopah	16.2	2,493	2,386	2,179	(-8.7)%	135

Source: U.S. Census Bureau

Table 6: Tribal Population Data

Nation	Tribal Reservation Area (Sq. Mi.)	Population		Percentage Population Change 2010-2020	Population Density
		2010	2020		
Duckwater Shoshone	6.01	214	219	2.3%	36

Source: U.S. Census Bureau

3.4 Social Vulnerability

Each participating jurisdiction has socially vulnerable and at-risk populations, populations that may have difficulty with medical issues, poverty, extremes in age, and communications due to language barriers. Several principles may be considered when discussing potentially at-risk populations, including:

- Not all people who are considered at risk are at risk
- Outward appearance does not necessarily mark a person as at risk
- The hazard event will, in many cases, affect at risk population in differing ways

The National Response Framework defines at risk populations as "populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining independence, communication, transportation, supervision, and medical care." The following tables present information on potential at risk populations within Nye County:

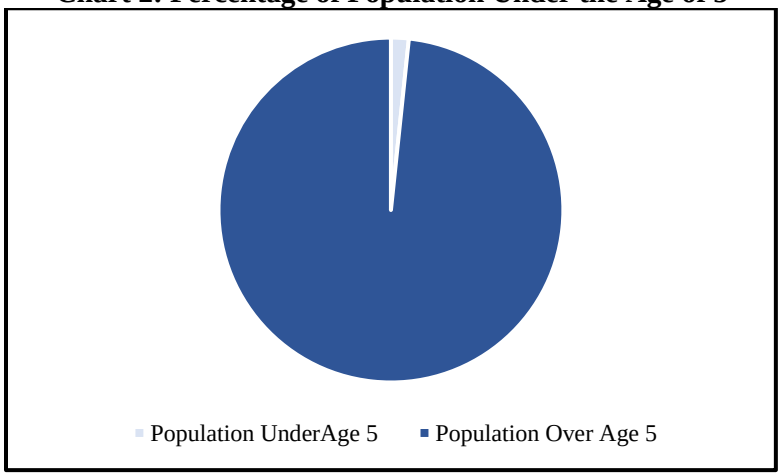
Table 7: Nye County Potential at Risk Population Data

Jurisdiction	Population 5 and Under (2020)	Population Over 65 (2020)	Speak a Language Other Than English (2020)	Estimated People in Poverty (2020)
Nye County	858 (1.7%)	7,515 (14.6%)	6,243 (12.1%)	8,048 (15.6%)
Amargosa Valley	115 (10.8%)	257 (24.2%)	455 (42.8%)	586 (55.1%)
Beatty	0 (0.0%)	248 (32.5%)	84 (11.0%)	162 (21.3%)
Gabbs	70 (37.6%)	45 24.2%)	0 (0.0%)	0 (0.0%)
Pahrump	1,906 (4.3%)	13,405 (30.0%)	5,100 (11.4%)	6,442 (14.4%)
Round Mountain	160 (17.1%)	126 (13.5%)	79 (8.5%)	108 (11.6%)
Tonopah	18 (0.8%)	745 (34.2%)	190 (8.7%)	418 (19.2%)
Duckwater Shoshone	30 (13.7%)	50 (22.8%)	60 (27.5%(	75 (34.2%)

Source: United States Census Bureau 2020

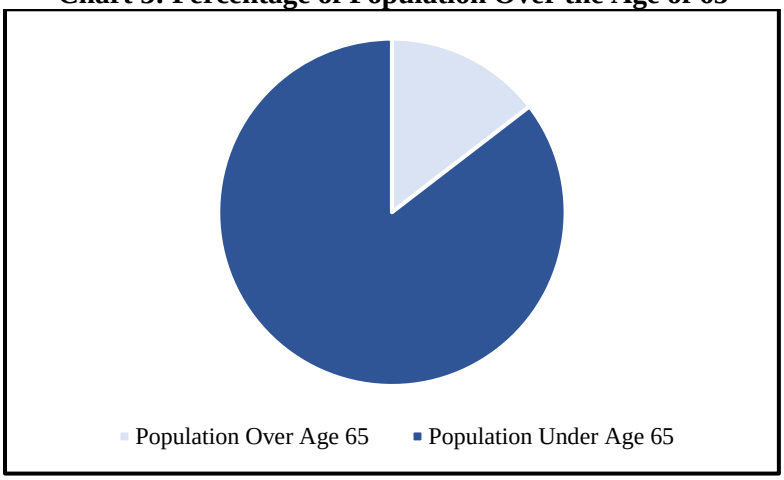
The following charts, from United States Census Bureau information, detail the County level information on the above table:

Chart 2: Percentage of Population Under the Age of 5



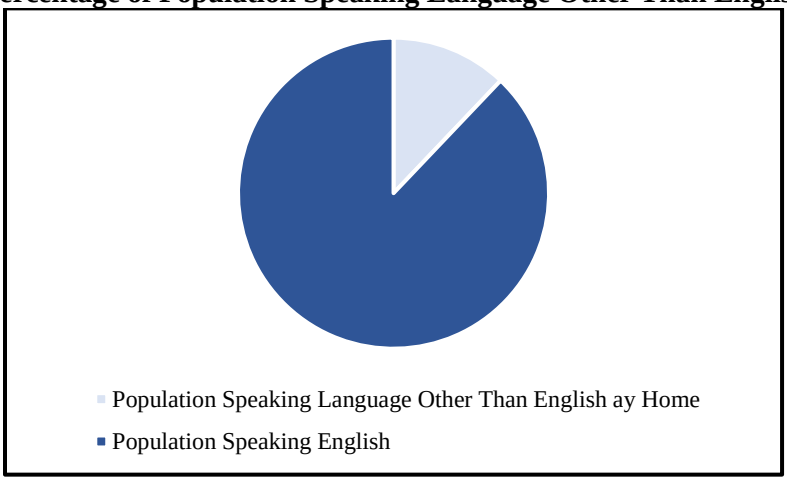
Source: United States Census Bureau

Chart 3: Percentage of Population Over the Age of 65



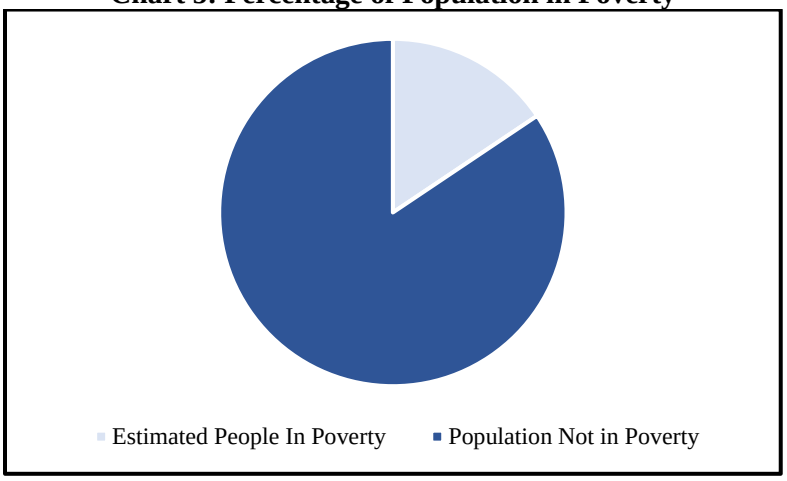
Source: United States Census Bureau

Chart 4: Percentage of Population Speaking Language Other Than English at Home



Source: United States Census Bureau

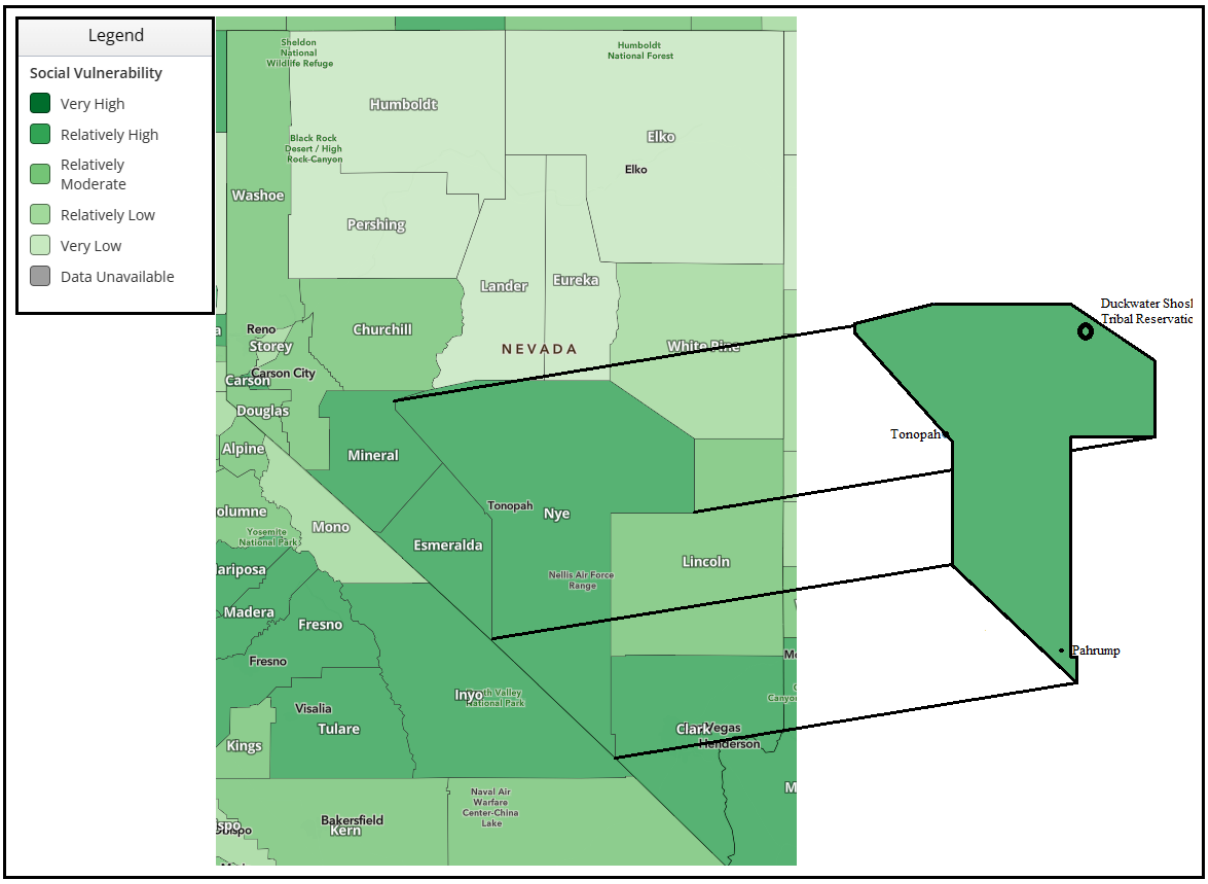
Chart 5: Percentage of Population in Poverty



Source: United States Census Bureau

Data collection and mapping from the NRI is used to determine social vulnerability, the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. A Social Vulnerability score and rating represent the relative level of a community's social vulnerability compared to all other communities at the same level. A community's Social Vulnerability score is proportional to a community's risk. The following map indicates the Social Vulnerability score of Nye County:

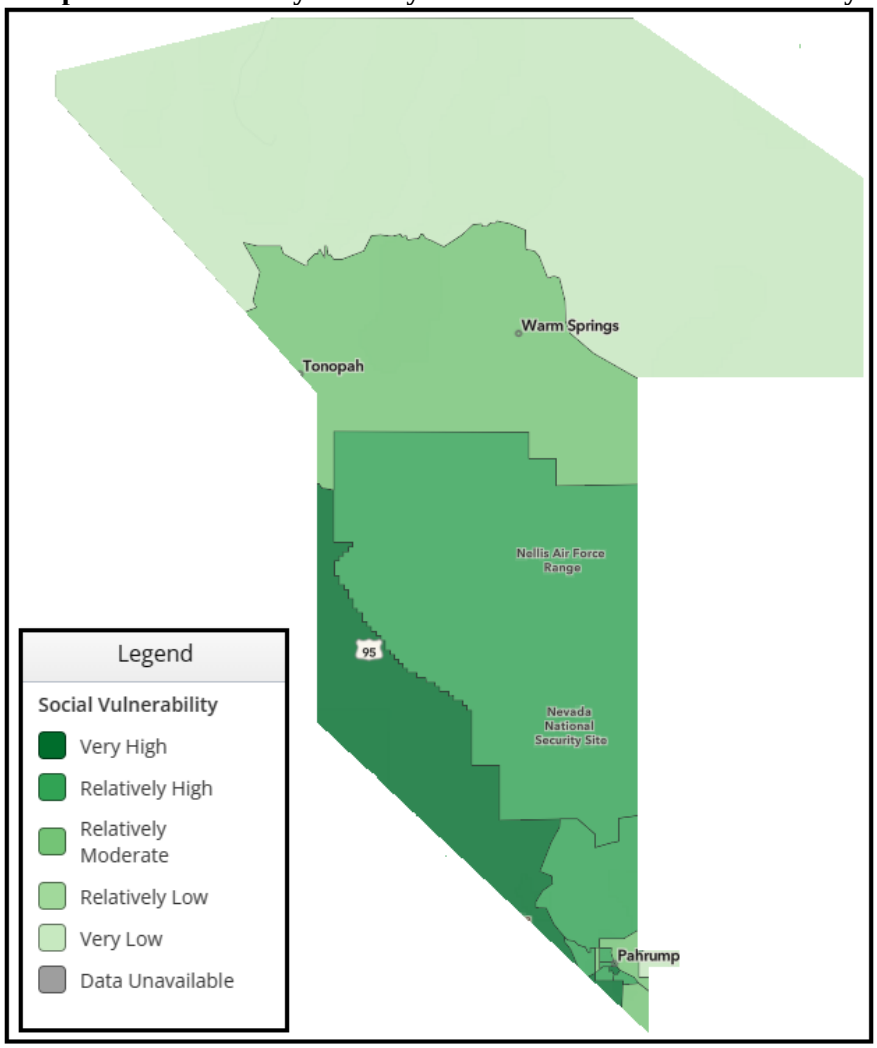
Map 3: FEMA NRI Nye County Social Vulnerability



Source: FEMA NRI

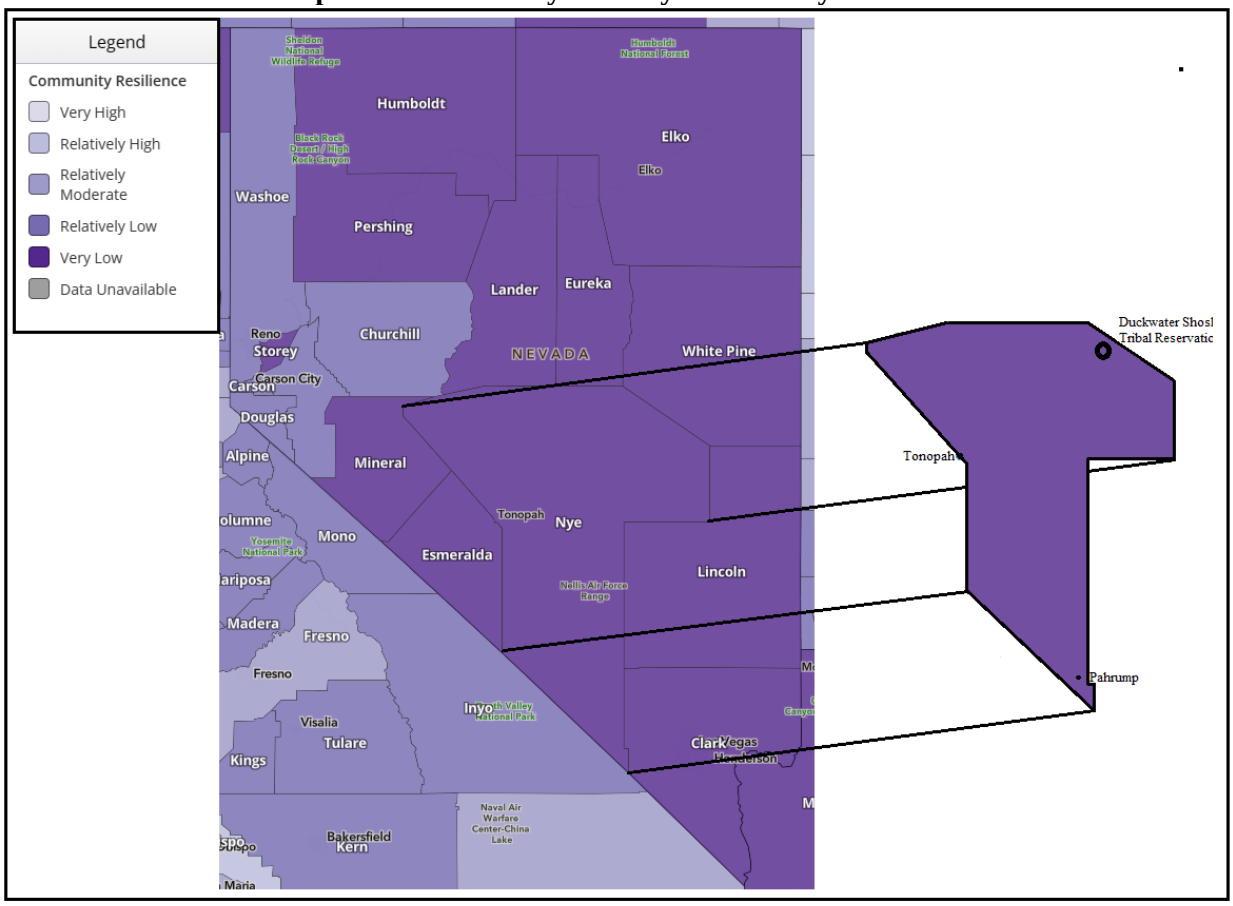
To help understand the social vulnerability of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions. The following map indicates the Social Vulnerability scores for census tracts within Nye County:

Map 4: FEMA NRI Nye County Jurisdictional Social Vulnerability



Community resilience is the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions. As a consequence reduction risk component of the NRI, a Community Resilience score and rating represent the relative level of a community's resilience compared to all other communities at the same level. A Community Resilience score is inversely proportional to a community's risk. The following map indicates the Community Resilience score of Nye County:

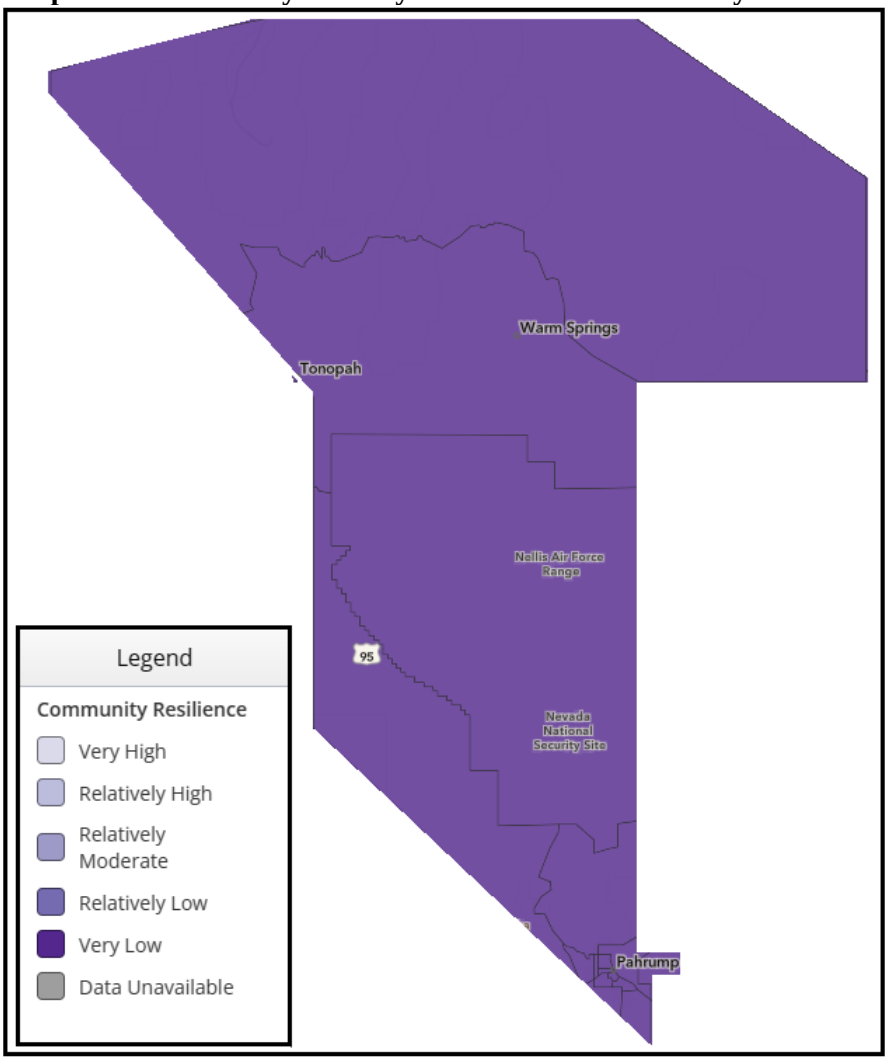
Map 5: FEMA NRI Nye County Community Resilience



Source: FEMA NRI

To help understand the community resilience of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions. The following map indicates the Community Resilience scores for census tracts within Nye County:

Map 6: FEMA NRI Nye County Jurisdictional Community Resilience



3.5 Housing Data

The following data from HAZUS indicates that there are 27,828 buildings in the county, with approximately 91% being identified as residential structures, which have an aggregate total replacement value of $9,777,388,000. The following tables indicates occupancy type and estimated replacement value for these structures:

Table 8: Nye County HAZUS Valuations

Occupancy Type	Exposure (Dollars)	Percentage of Total
Residential	$6,322,706,000	64.7%
Commercial	$2,260,604,000	23.1%
Industrial	$715,000,000	7.3%
Education	$320,948,000	3.3%
Government	$98,109,000	1.0%
Religion	$53,377,000	0.5%
Agricultural	$6,199,000	0.1%

Source: FEMA HAZUS

Data from the United States Census Bureau in the table below details the participating jurisdictions' housing information:

Table 9: Nye County Housing Data

Jurisdiction	Occupied Housing Units (2010)	Occupied Housing Units (2020)	Percentage Change in Occupied Housing Units (2010-2020)
Nye County	23,350	25,191	7.9%
Amargosa Valley	711	475	(-33.2)%
Beatty	700	556	(-20.6)%
Duckwater	163	127	(-22.1)%
Gabbs	183	138	(-24.6)%
Pahrump	17,824	21,488	20.6%
Round Mountain	734	993	35.3%
Tonopah	1,576	1,201	(-23.8)%

Source: United States Census Bureau

Of particular concern are mobile home residences. Data from the NOAA National Severe Storms Laboratory reports that people living in mobile homes are especially at risk for injury and death as even anchored mobile homes can be seriously damaged when winds gust over 80 miles per hour. Additionally, study data from Michigan State University reported that the two biggest factors related to wind event fatalities were housing quality (measured by mobile homes as a proportion of housing units) and income level. When a tornadic wind strikes, a county with double the number of mobile homes as a proportion of all homes will experience 62% more fatalities than a county with fewer mobile homes, according to the study data. The following indicates the percentage of mobile homes for each participating jurisdiction:

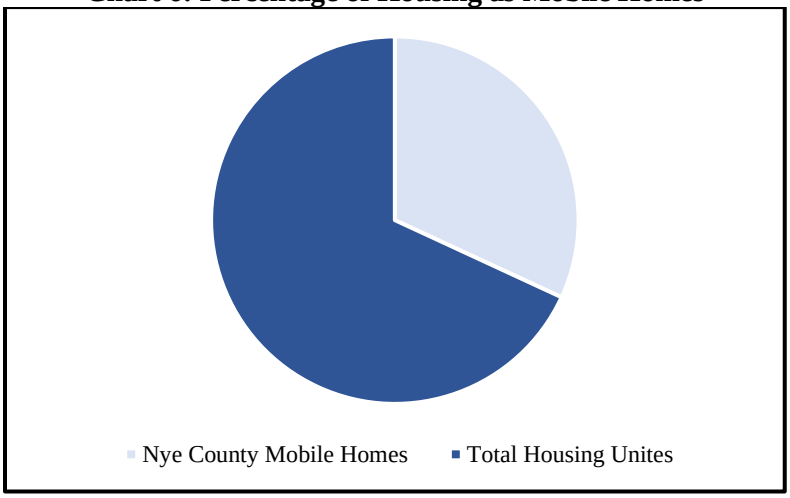
Table 10: Nye County Mobile Home Data

Jurisdiction	Number of Mobile Homes (2020)	Percentage Of Housing Stock as Mobile Homes (2020))
Nye County	8,035	31.9%
Amargosa Valley	371	78.0%
Beatty	224	40.3%
Duckwater	43	33.7%
Gabbs	103	74.4%
Pahrump	4,899	22.8%
Round Mountain	840	84.6%
Tonopah	151	12.6%

Source: United States Census Bureau

The following chart details the percentage of Nye County housing indicated as mobile homes:

Chart 6: Percentage of Housing as Mobile Homes



Source: United States Census Bureau

3.6 Public Schools

The following table details the school's name, location, 2022 enrollment, and grades served:

Table 11: Nye County Public School Enrollment Information

School	Location	Enrollment (2022)	Grades Served
Amargosa Valley Elementary and Middle School	Amargosa Valley	148	PreK-8
Beatty Elementary and Middle Schools	Beatty	105	K-8
Beatty High School	Beatty	104	9-12
Duckwater School	Duckwater	12	K-8
Floyd Elementary	Pahrump	514	PreK-5
Gabbs School	Gabbs	24	K-12
Hafen Elementary	Pahrump	425	PreK-5
J.G. Johnson Elementary	Pahrump	439	PreK-5
Manse Elementary	Pahrump	464	PreK-5
Pahrump Valley High School	Pahrump	1,342	9-12
Pathways Schools	Pahrump	138	9-12
Rosemary Clarke Middle School	Pahrump	976	6-8
Round Mountain Elementary School	Round Mountain	121	PreK-5
Round Mountain Middle and High School	Round Mountain	143	6-12
Tonopah Elementary School	Tonopah	156	K-12
Tonopah Middle and High School	Tonopah	867	K-12

Source: Nye County

3.7 Land Management

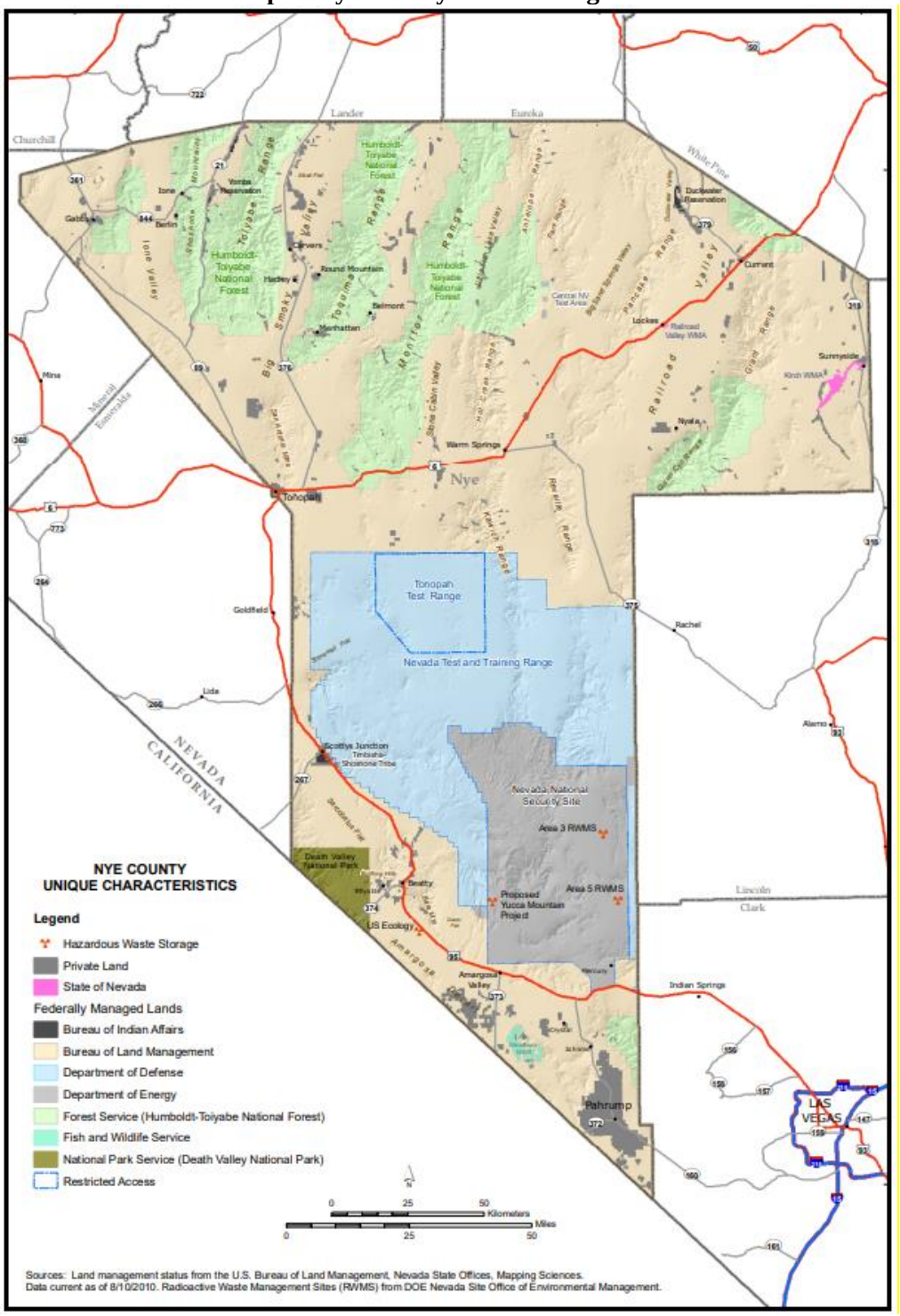
Approximately 98%of land in Nye County is federally owned and not available for private or County use. The following table indicates the land management in the county:

Table 12: Nye County Land Management Information

Land Manager	Acres Managed	Percentage of Total County Acreage
Bureau of Land Management	6,553,000	56%
US Forest Service	1,962,000	17%
Department of Defense	1,852,000	16%
Department of Energy	863,000	7%
Private	247,000	2%
National Park Service	108,000	1%
State of Nevada	19,000	<1%
Bureau of Indian Affairs	8,000	<1%

Source: Nye County

Map 7: Nye County Land Management



Source: Nye County

Based on the available data, it is likely that Nye County will retain its mostly rural character during the life of this plan. Based on demographic data, Nye County and all participating jurisdictions will see a static, or slightly decreased risk to identified hazards due to changing populations.

3.8 Critical Facilities

Certain facilities have a net positive value on the community as they contribute to the public good by facilitating the basic functions of society. These facilities maintain order, public health, education, and help the economy function. Additionally, there are infrastructure and facilities integral to disaster response and recovery operations. Conversely, some infrastructure and facilities are of extreme importance due to the negative externalities created when they are impacted by a disaster. What fits these definitions will vary slightly from community to community, but the definitions remain as a guideline for identifying critical facilities and infrastructure. For Nye County and its participating jurisdictions, the table below lists the identified critical facilities. A complete list can be found in Appendix D.

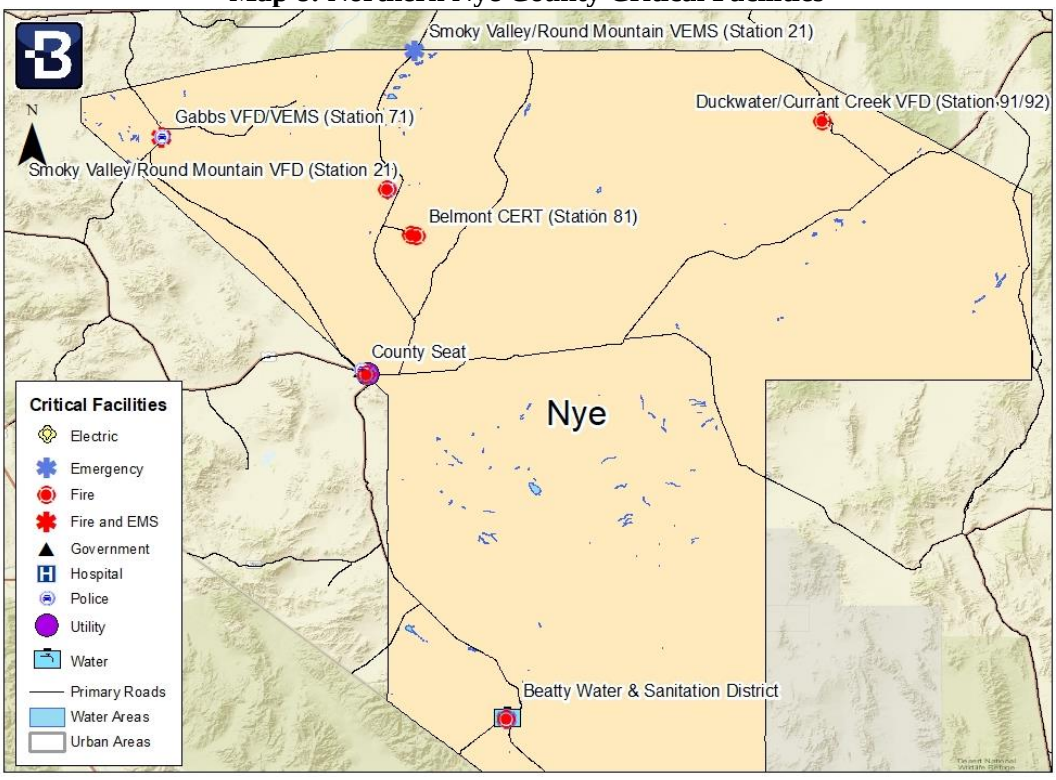
Table 13: Nye County Critical Facilities

Facility Type	Total, Nye County
Emergency Operations Center	3
Fire Stations	16
Hospital	1
Law Enforcement Facilities	7
Utility Facilities	6

Source: Nye County and Participating Jurisdictions

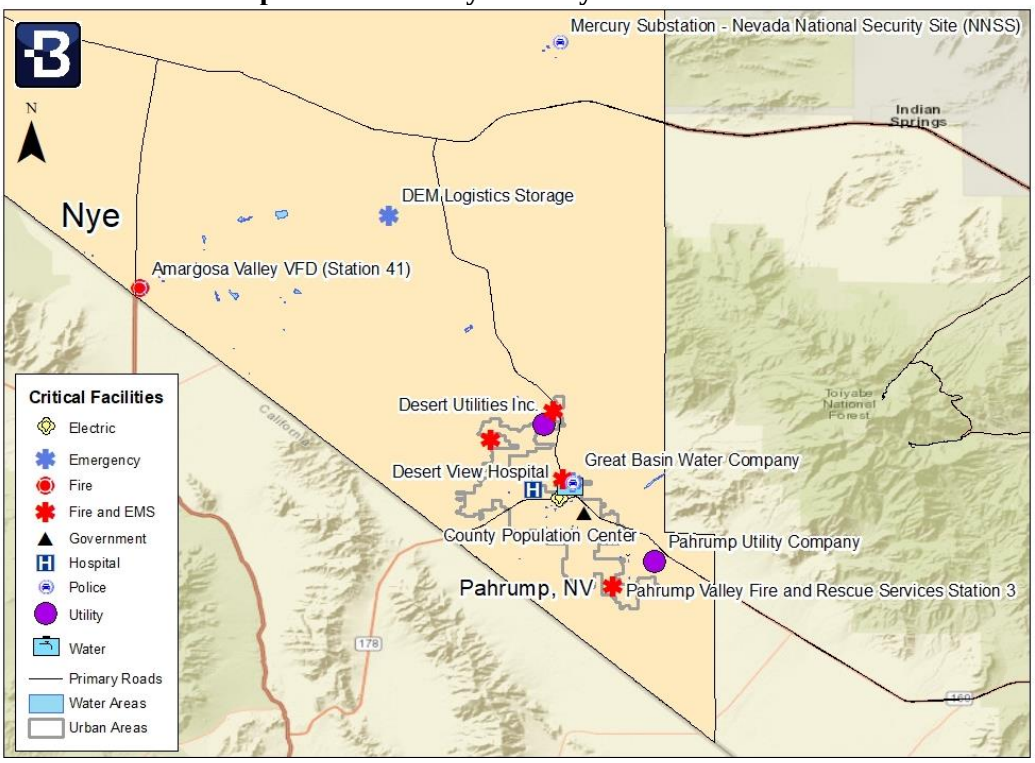
The following maps detail critical facility locations for participating jurisdictions.

Map 8: Northern Nye County Critical Facilities



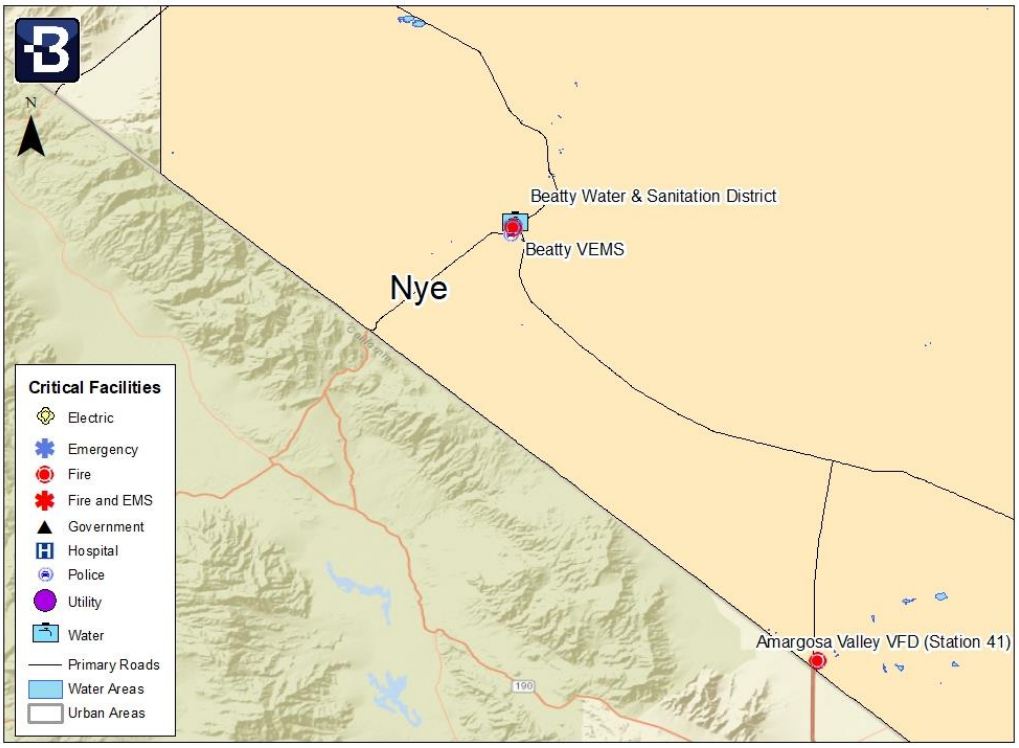
Source: Nye County and BOLDplanning

Map 9: Southeast Nye County Critical Facilities



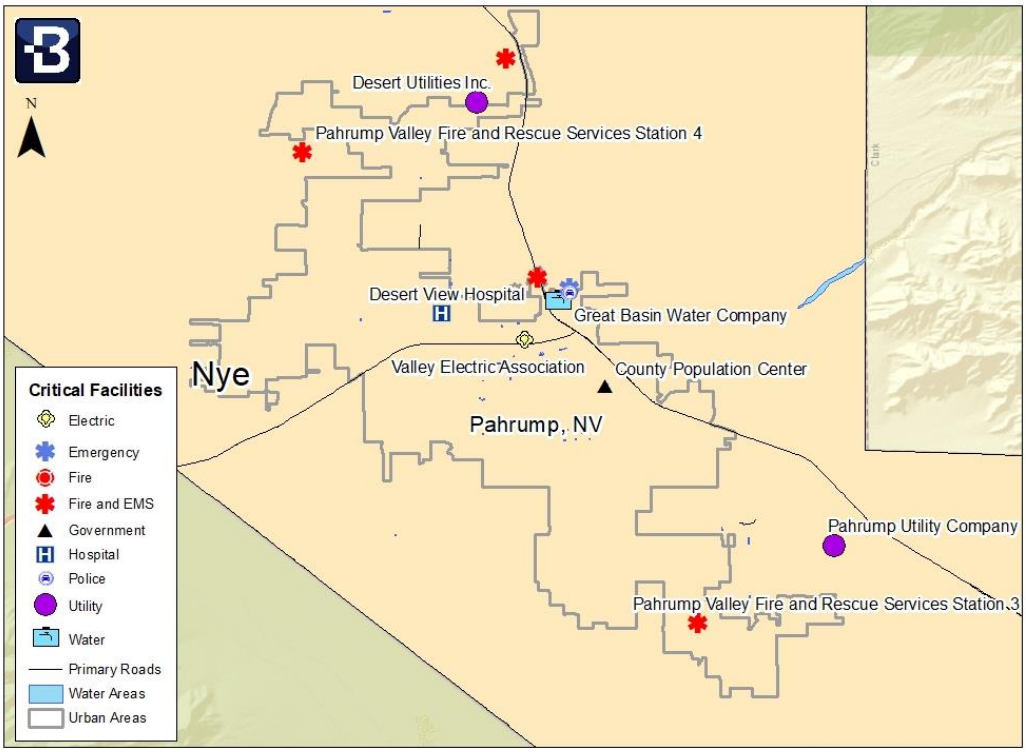
Source: Nye County and BOLDplanning

Map 10: Southwest Nye County Critical Facilities



Source: Nye County and BOLDplanning

Map 11: Pahrump Critical Facilities



Source: Nye County and BOLDplanning

3.9 Tribal Sacred Sites

During the planning process, the Duckwater Shoshone Nation elected not to detail any tribal sacred sites.

3.10 Agricultural Data

The United States Department of Agriculture (USDA) National Agricultural Statistics Service 2017 Census of Agriculture indicates that a very small portion (0.8%) of the land is Nye County is used for agricultural purposes. The following table details information from the USDA Census of Agriculture for 2007, 2012, and 2017 (the latest available data) for Nye County:

Table 14: Nye County Agricultural Data

Agricultural Census Year	Number of Farms	Farm Acreage	Cropland Acreage	Number of Cattle	Market Value of Agricultural Products Sold
2007	173	90,868	28,080	29,422	$58,238,000
2012	198	65,116	26,354	28,672	$70,495,000
2017	211	93,334	22,362	33,982	$64,972,000
Percentage Change 2007 - 2017	22.0%	2.7%	(-20.4)%	15.5%	11.6%

Source: United States Department of Agriculture National Agricultural Statistics Service

3.11 Development Trends

A summary assessment for development trends and growth (as they apply to changes in a jurisdiction's vulnerability and risk) can be broken down into two categories, area-wide hazards and point hazards. Area-wide hazards indiscriminately impact the entire planning area. Since it is beyond scientific measurement where an area-wide hazard, such as winter storms, will impact, and likely it will impact everywhere, it is reasonable to assume any significant growth and development will increase vulnerability and risk. Additionally, if a jurisdiction develops or populates a known hazard area (point hazard) that jurisdiction's vulnerability and risk increase by an amount equal to the development or growth that now exists in that identified hazard area.

It is anticipated that Nye County and Pahrump will see increasing populations levels over the life of this plan. All additional participating jurisdictions are expected to see static or decreasing population levels over the life of this plan.

The following table uses data from the Nevada Department of Taxation State Demographer and the United States Census Bureau to show population projections for Nye County through 2040:

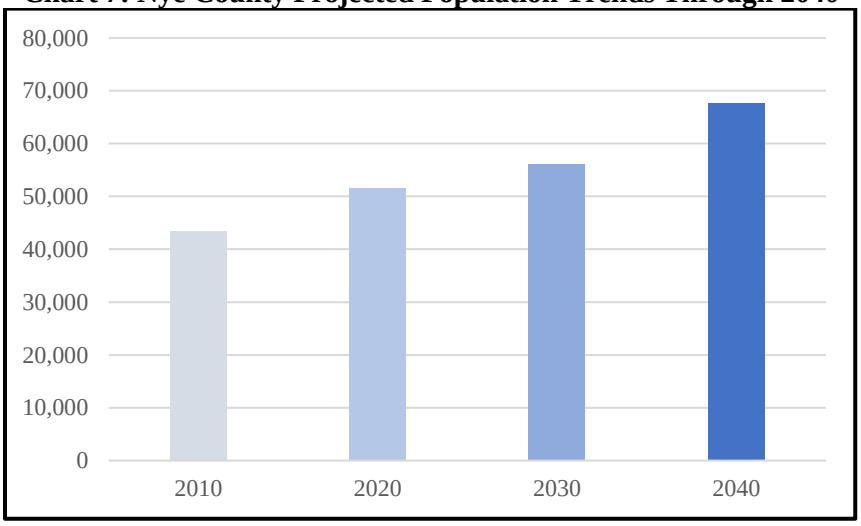
Table 15: Nye County Projected Population Growth Through 2040

2010	2020	2030	2040
43,496	51,591	55,210	67,656

Source: United States Census Bureau and Nevada Department of Taxation State Demographer

The following chart details projected population trends for Nye County through 2040:

Chart 7: Nye County Projected Population Trends Through 2040



Source: United States Census Bureau and Nevada Department of Taxation State Demographer

In addition, using United States Census Bureau data from 2010 and 2020, the following population predictions have been generated for all participating jurisdictions using the growth rate for that period (limitations to this method apply including, but not limited to, migration, economic drivers, and climate change).

Table 16: Nye County Participating Jurisdictions Projected Population Growth Through 2040

Jurisdiction	2010	2020	2030	2040	Growth Rate Used
Amargosa Valley	1,262	1,064	897	756	(-15.7)%
Beatty	795	762	730	700	(-4.2)%
Gabbs	296	186	109	64	(-41.5)%
Pahrump	36,441	44,738	54,938	67,463	22.8%
Round Mountain	1,944	933	552	327	(-40,8)%
Tonopah	2,386	2,179	1,989	1,816	(-8.7)%

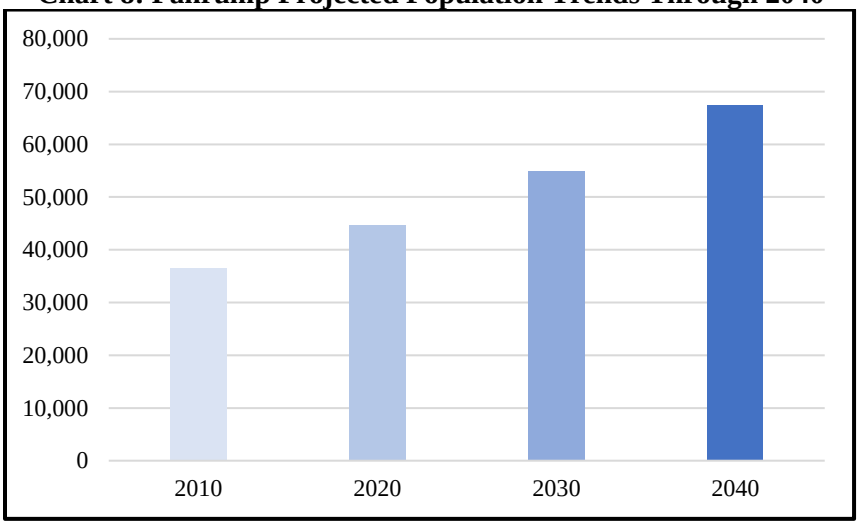
Source: United States Census Bureau

Table 17: Nye County Tribal Projected Population Growth Through 2040

Nation	2010	2020	2030	2040	Growth Rate Used
Duckwater Shoshone	216	1,064	897	756	(-15.7)%

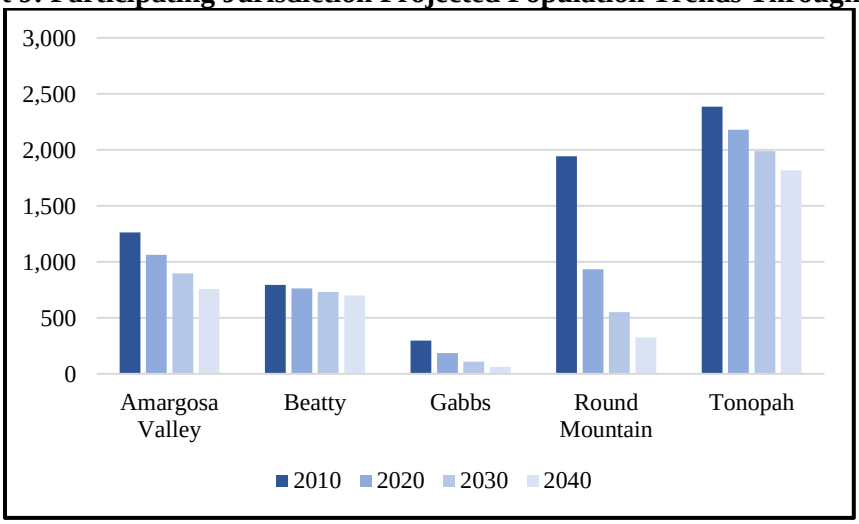
Source: United States Census Bureau

Chart 8: Pahrump Projected Population Trends Through 2040



Source: United States Census Bureau

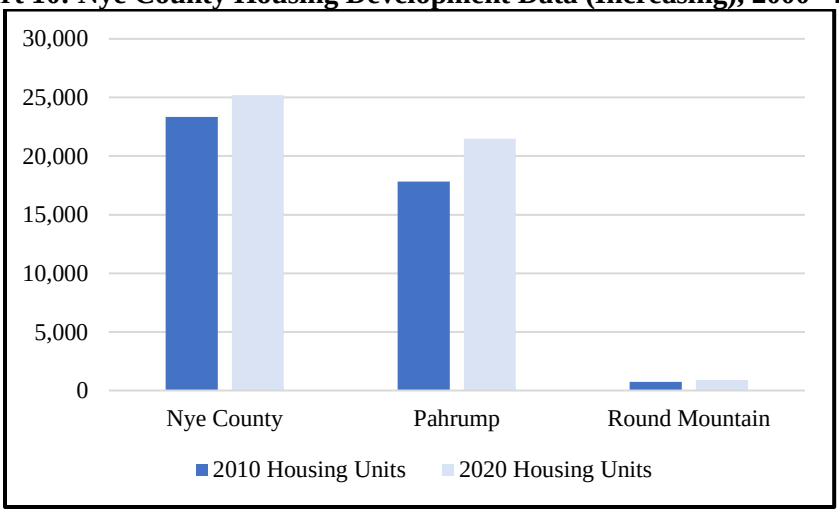
Chart 9: Participating Jurisdiction Projected Population Trends Through 2040



Source: United States Census Bureau

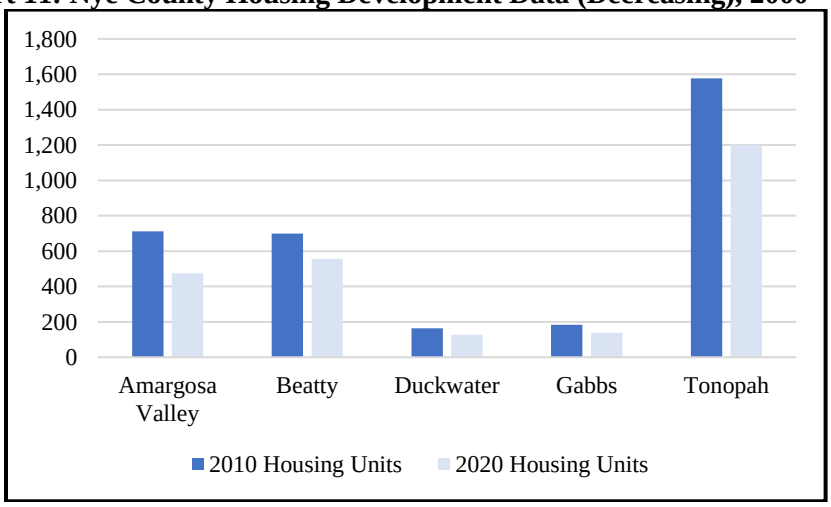
It is anticipated that Nye County, and specifically Pahrump, will see increasing housing levels over the life of this plan. While Round Mountain has indicated a housing increase over the period 2010 to 2020, it is anticipated that this will trend down due to population projections. This increase will likely equate to increased vulnerability to identified hazards for Nye County and Pahrump, while resulting in decreased potential vulnerability for all other participating jurisdictions. The following charts detail housing development trends for Nye County and participating jurisdictions from 2000 to 2020:

Chart 10: Nye County Housing Development Data (Increasing), 2000 - 2020



Source: United States Census Bureau

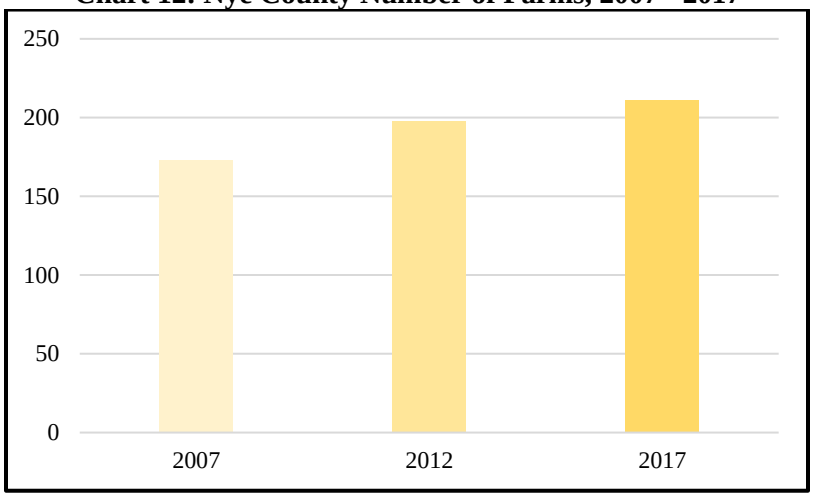
Chart 11: Nye County Housing Development Data (Decreasing), 2000 - 2020



Source: United States Census Bureau

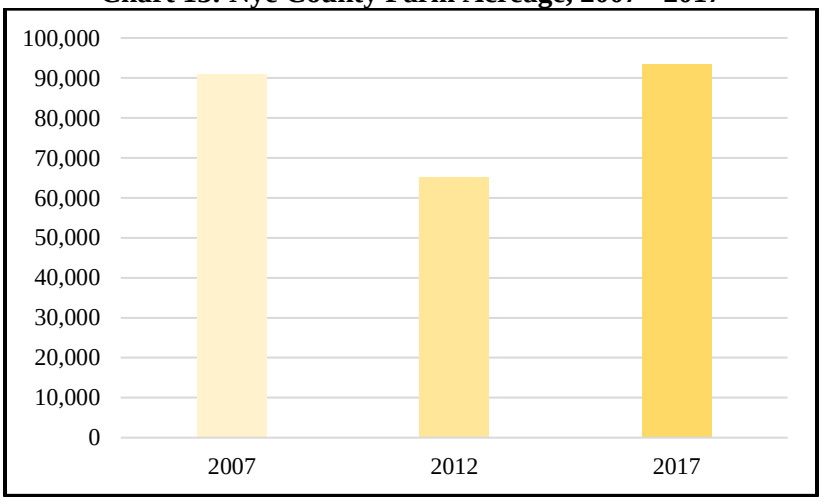
The small amount of land used for agricultural purposes, the relatively static nature in farms and cattle, and the generally static market value of agricultural products sold in the county indicates that potential impacts to agriculture are not a major vulnerability concern for the county. Additionally, due to the nature of the soil, climate, and water availability in the county, it is anticipated that no major agricultural development will occur over the life of this plan. The following carts detail agricultural changes for Nye County from 2007 to 2017 (latest available data):

Chart 12: Nye County Number of Farms, 2007 - 2017



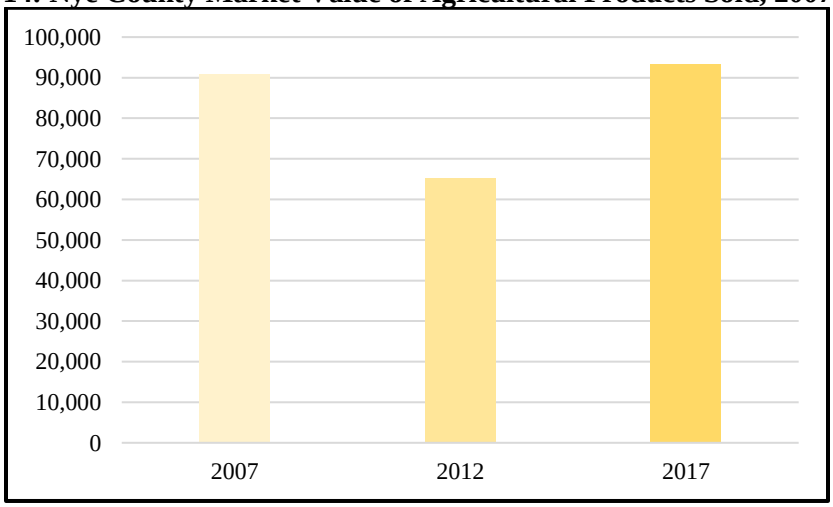
Source: USDA Census of Agriculture

Chart 13: Nye County Farm Acreage, 2007 - 2017



Source: USDA Census of Agriculture

Chart 14: Nye County Market Value of Agricultural Products Sold, 2007 - 2017



Source: USDA Census of Agriculture

3.12 Infrastructure Development

Infrastructure repair can have a significant impact on regional development, both positive and negative. The specific effects depend on the scale of the repair projects, the quality of the infrastructure, and the overall economic and social context of the region, and may include:

- Improved Connectivity: Repairing and upgrading infrastructure, such as roads, bridges, and ports, can enhance connectivity within and between regions. This improved connectivity can reduce transportation costs, facilitate the movement of goods and people, and attract businesses and investments to the region.
- Economic Growth: Functional infrastructure supports economic activities. When infrastructure is repaired, it can create jobs directly in the construction and maintenance sectors. Additionally, it can indirectly stimulate economic growth by providing a reliable foundation for businesses to operate and expand, leading to increased production and trade.
- Enhanced Productivity: Well-maintained infrastructure can increase productivity by reducing downtime and transportation delays. This, in turn, can make regional industries more competitive and efficient.
- Attracting Investment: Regions with modern and well-maintained infrastructure are often more attractive to investors. Businesses are more likely to invest in regions with reliable transportation, utilities, and communication networks, as it reduces operational risks and costs.
- Quality of Life: Infrastructure repair can enhance the quality of life for residents by providing access to essential services such as clean water, sanitation, healthcare, and education. This can contribute to improved human development indicators and overall well-being.
- Resilience and Disaster Mitigation: Infrastructure repair can include upgrades to make infrastructure more resilient to natural disasters and climate change impacts. This can help protect communities and assets and reduce the long-term costs of recovery and reconstruction.
- Social Equity: Infrastructure repair can address disparities in access to essential services. It can benefit marginalized communities by providing them with equal access to transportation, utilities, and public facilities.

However, it is important to note that there can be negative impacts as well, including:

- Disruption During Construction: Repair projects can disrupt communities and businesses during the construction phase, leading to short-term challenges.
- Costs and Budget Constraints: Large-scale infrastructure repair projects can be costly, and they may strain regional budgets or lead to increased taxes or debt.
- Environmental Concerns: If not done carefully, infrastructure repair projects can have adverse environmental impacts, such as habitat disruption or water pollution.

Recent significant state, county, and local infrastructure projects within Nye County include:

A few new infrastructure projects have been completed in Nye County since the completion of the last HMP. Additionally, small scale and maintenance projects on existing infrastructure continue. Of note:

- Nevada Department of Transportation: Awarded a $17,100,000 construction contract to improve a 32-mile stretch of U.S. Highway 95 in Nye County.
- Community Development Block Grant: $500,000 for the construction of a new fueling system at the Tonopah Airport in Nye County.
- Conservation Infrastructure Initiative Grant Award: A $3,873,038 grant award through the Nevada Department of Conservation and Natural Resources to improve the Gabb's Water System.
- Environmental Protection Agency Brownfields Assessment Grant: Awarded a $434,000 grant to conduct environmental site assessments and prepare cleanup and reuse plans. Priority sites include the Duckwater Shoshone Tribe solid waste facility.

- Coronavirus State and Local Fiscal Recovery Funds through the American Rescue Plan Act:
    - $2,430,000 for the construction of a facility for the purpose of public refuge related to a pandemic, natural disaster, and other large-scale public health/safety/security event.
    - $300,000 to assist vulnerable populations, including children & families with housing support and coordination.
    - $175,000 for the construction of signage at fire stations in Pahrump.
    - $285,000 for Nye County Water District to engage with a vendor to provide cloud seeding service.

All current and future development is potentially vulnerable to the hazards identified in this plan. However, many of the participating jurisdictions of Nye County have taken steps to reduce the potential impacts through the utilization of building codes.

Finally, there have been no major changes in existing jurisdictional or Duckwater Shoshone Tribal Nation facilities, either through construction or renovation. Additionally, a review of jurisdictional budgets, as possible, does not indicate any future projects related to increasing the resilience of any existing facilities or of construction facilities. As such, it is expected that the vulnerability of jurisdictional facilities is generally the same as during the life of the previous plan and will remain generally the same during the life of this plan.

3.13 Climate Change

For hazards related to weather patterns, climate change may cause significant changes in patterns and event frequency. There is a scientific consensus that climate change is occurring, and recent climate modeling results indicate that extreme weather events may become more common. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events, including:

- Longer and more intense heat waves
- An increased risk of wildfires
- Higher wind speeds
- Greater rainfall intensity, but less rainfall frequency

According to the United States Environmental Protection Agency's "What Climate Change Means for Nevada:"

- The changing climate is likely to increase the need for water but reduce the supply.
- Higher temperatures increase rates of water evaporation from soils, plants, and surface waters.
- Soils are likely to be drier, and periods without rain are likely to become longer, making droughts more severe.
- The continuing decline in snowpack could limit the supply of water for some purposes.
- Drought conditions are likely to increase and persist.
- Less water is likely to be available for ranches or farmers who irrigate crops.
- Higher temperatures and drought are likely to increase the severity, frequency, and extent of wildfires.
- Warmer weather can increase the production of ground-level ozone.
- High air temperatures can cause heat stroke and dehydration.

Additionally, the Nevada State Climate Initiative fact sheet provides specific details about how climate change will continue to impact the state of Nevada. The following table details trends in climate change and provides a confidence level on those trends continuing:

Table 18: Potential Impacts of Climate Change for Nye County

Event	Historical Trends	Projected Trends and Confidence	Confidence
Heat	Temperatures are increasing. Urban areas are warming faster than rural areas.	Average temperatures will rise. Heat waves will increase in frequency and severity.	High
Precipitation	Precipitation has not increased or decreased.	It's not clear how precipitation will change. The average across recent models suggests a slight increase in precipitation over central and northern Nevada.	Low
Drought	Increasing evaporative demand due to higher temperatures has worsened droughts.	Drought will increase in frequency and severity, in part due to higher temperatures, even if precipitation remains the same or increases slightly.	High
Loss of Snow	Snowpack decreased between 1955 and 2016.	There will be a shift from snow to rain during the winter, and snow will melt earlier in the winter and spring.	High
Floods	There were no historical trends in flooding.	Flooding will be more frequent owing to a shift from snow to rain and more intense storms, even if precipitation does not increase.	High
Wildfire	Wildfire size and severity have been increasing.	Warmer temperatures will increase wildfire risk.	High

Source: Nevada Climate Initiative

Section 4 – Hazard Profiles

4.1 Introduction

The ultimate purpose of this HMP is to minimize the loss of life and property. To accomplish this, all relevant hazards and vulnerabilities Nye County and its participating jurisdictions face have been identified. Once this identification has been completed, Nye County and all participating jurisdictions can use the accumulated data to assist in the development and prioritization of mitigation action to defend against these potential risks.

4.2 Methodology

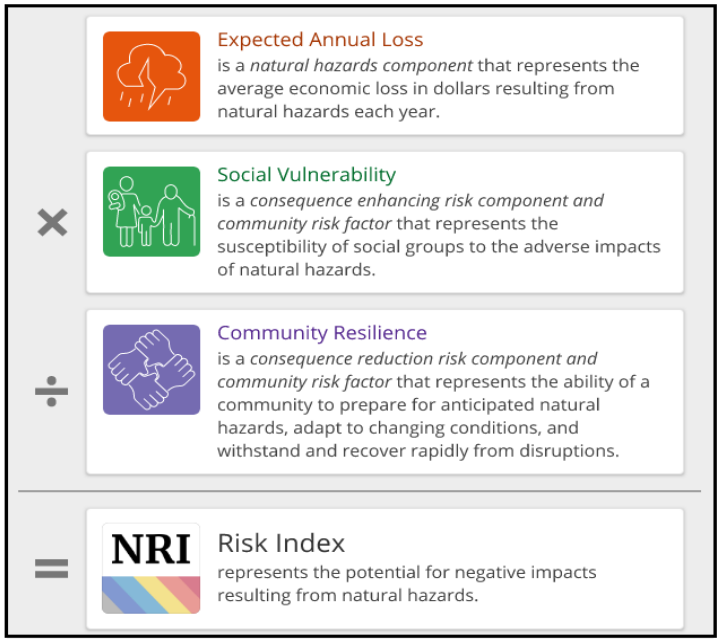
Each hazard that has historically, or could potentially, affect Nye County and its participating jurisdictions is reviewed and discussed in detail. In general, each hazard details the following information:

- Hazard description
- Location and extent, including any varied risk across the county
- Previous occurrences
- Probability of future events
- Potential vulnerability and impact
- Potential impact of climate change
- Land use and development trends

NOAA's National Centers for Environmental Information (NCEI) Storm Events Database was used as the primary source of information for previous occurrences of storm events. It is worth noting that damage estimates indicated by the NCEI are often artificially low because of the way the events are reported to the NCEI, often by the local National Weather Service (NWS) office. When reporting an event oftentimes the NWS office does not have access to the actual damage assessment. As such, the report often details a very low amount or zero-dollar amount for damages. Most of the events from NCEI are not associated with a federal emergency or disaster. If the event occurred at the same time as an event that was later determined to be a federal emergency or dis aster, it is included with the NCEI data even if it occurred in a county not included in the federal declaration. Where data sets were unavailable, local reporting was relied upon.

In addition, the FEMA National Risk Index (NRI) dataset and online tool was used to determine community risk for identified natural hazards. The risk equation behind the NRI is as follows:

Figure 1: FEMA NRI



As part of the NRI, Expected Annual Loss (EAL) represents the average economic loss in dollars resulting from a hazard each year. It quantifies loss for relevant consequence types, buildings, people, and agriculture. An EAL score and rating represent a community's relative level of expected losses each year when compared to all other communities at the same level. EAL is calculated using an equation that includes exposure, annualized frequency, and historic loss ratio risk factors. Exposure is a factor that measures the building value, population, and agriculture value potentially exposed to a natural hazard occurrence. Annualized frequency is a factor that measures the expected frequency or probability of a hazard occurrence per year. Historic loss ratio is a factor that measures the percentage of the exposed consequence type value (building, population, or agriculture) expected to be lost due to an occurrence. EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk.

For both the Risk Index and EAL there is a qualitative rating that describes the nature of a community's score in comparison to all other communities at the same level, ranging from "Very Low" to "Very High." Because all ratings are relative, there are no specific numeric values that determine the rating.

4.3 Declared Federal Disasters

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. The MPC reviewed the historical federal natural disaster declarations to assist in hazard identification. In the 20-year period from 2003 to 2022, with the years 2003 and 2022 being full dataset years, Nye County has experienced no Presidential Disaster Declarations related to natural disasters. Additionally, in the 20-year period from 2003 to 2022, Nye County has experienced no Emergency Declarations related to natural disasters.

4.4 Identified Potential Hazards

The first step in developing a hazard assessment is to identify the hazards that have a reasonable risk of occurring in Nye County and its participating jurisdictions. Proper identification allows for appropriate and well-planned action in order to mitigate e the extent and cascading impacts of an incident. Furthermore, while not all disaster contingencies can be planned for, applying an all-hazards approach to the mitigation process does yield greater awareness and better preparedness for unforeseen hazard incidents overall. The following table lists the natural hazards identified for Nye County:

Table 19: Nye County Identified Natural Hazards

Natural Hazard	Included in State of Nevada HMP	Included in Nye County HMP
Avalanche	Yes	No
Dam Failure	Yes	Yes
Drought	Yes	Yes
Earthquake	Yes	Yes
Expansive Soil	Yes	No
Extreme Heat	Yes	Yes
Flood	Yes	Yes
Land Subsidence	Yes	No
Landslide	Yes	No
Severe Thunderstorms	Yes	Yes
Tornado	Yes	No
Tsunami/Seiche	Yes	No
Wildfire	Yes	Yes
Winter Storms	Yes	Yes
Volcano	Yes	No

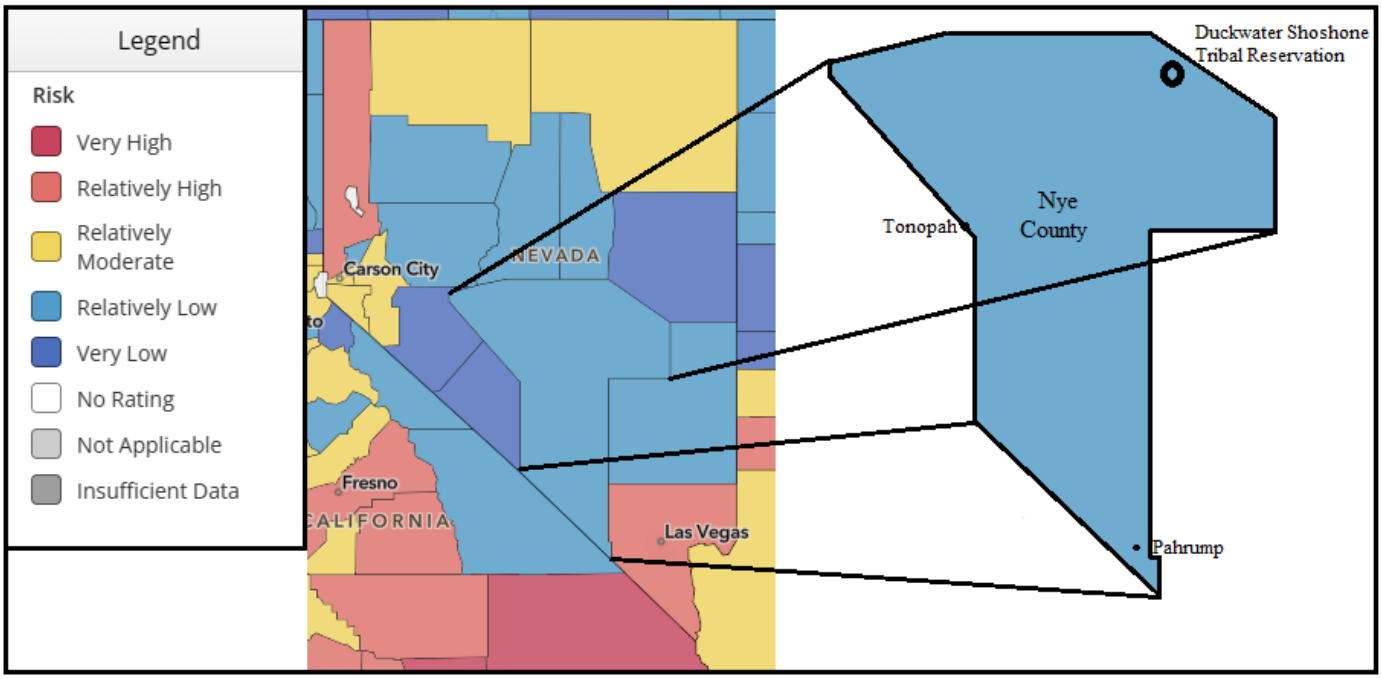
Based on discussion with the MPC, a lack of identified risk or history, and geographic improbability, numerous FEMA identified hazards such as coastal erosion and hurricane were not included in the scope of this plan. Additionally, the following natural hazards included in the State of Nevada HMP were not included for the enumerated reasons:

- **Avalanche:** There have been no recorded damaging avalanches in Nye County. Additionally, the State of Nevada 2018 HMP indicates that Nye County and all participating jurisdictions do not have an avalanche risk. Due to the lack of documented history, and unlikelihood of occurrence, the MPC opted to not allocate potential resources or funding to mitigate against this hazard in favor of prioritizing other hazards.
- **Expansive Soils:** Information from the United States Geological Service (USGS) Swelling Clays Map of the Conterminous United States indicates that the majority of Nye County has soils with little or no clay, and thus no swelling potential. Small areas of the county are indicated to have soils that produce slight to moderate swelling potential. One previous small-scale occurrence of expansive soil was recorded. On the northwest side of Pahrump Valley expansive soils were blamed for causing foundation and septic damage to homes in the area. Because of the septic damage, some of the land in the area was contaminated. In response, the Nye County Commission passed a bill in October 2006 requiring disclosure of soil conditions to the buyer. Based on this action, the MPC opted to not allocate potential resources or funding to mitigate against this hazard in favor of prioritizing other hazards.
- **Land Subsidence:** There have been no recorded incidences of subsidence events in Nye County. Additionally, geologic maps indicate that Nye County has no areas of Karst topography, a known contributor to subsidence. Due to a lack of documented history and indicated risk, the MPC opted to not allocate potential resources or funding to mitigate against this hazard in favor of prioritizing other hazards.
- **Landslide:** There have been no recorded damaging landslide events in Nye County. Additionally, the 2018 State of Nevada HMP indicates that Nye County possesses low susceptibility for landslides.
- **Tornadoes:** Data from the NCEI indicates that over the 20-year period from 1993-2022 (full dataset years), Nye County has recorded two tornadoes rated at EF0 (the lowest rating for a tornado) with no resulting damage, deaths, or injuries. Due to the lack of recorded impacts, and unlikelihood of occurrence, the MPC opted to not allocate potential resources or funding to mitigate against this hazard in favor of prioritizing other hazards.
- **Tsunami/Seiche:** Data from the NCEI indicates that over the 20-year period from 1993-2012 (full dataset years), Nye County has recorded no tsunami or seiche events. Due to the lack of documented occurrences, and unlikelihood of future occurrences, the MPC opted to not allocate potential resources or funding to mitigate against this hazard in favor of prioritizing other hazards.
- **Volcano:** There have been no geologically recent recorded damaging volcanic events in Nye County in recent history. Additionally, the 2018 State of Nevada HMP indicates Nye County has no risk to volcanoes. Due to a lack of documented history and indicated risk, the MPC opted to not allocate potential resources or funding to mitigate against this hazard in favor of prioritizing other hazards.

4.5 Hazard Planning Significance

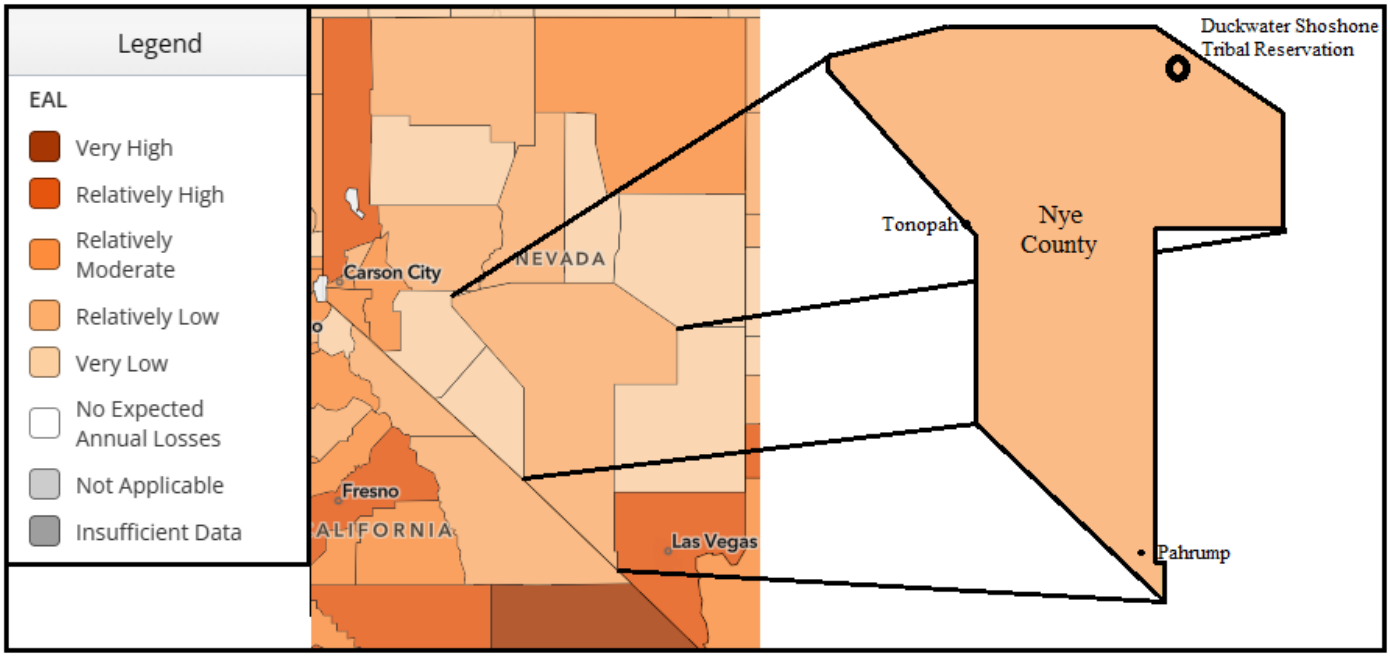
For purposes of this plan, hazard planning significance refers to the relevance of the identified hazard to the participating jurisdiction. In order to help quantify the planning significance, data from FEMA NRI was utilized. The following maps detail the overall risk index and EALs Calhoun County for the natural hazards identified in this plan:

Map 12: Natural Hazard NRI for Nye County



Source: FEMA NRI

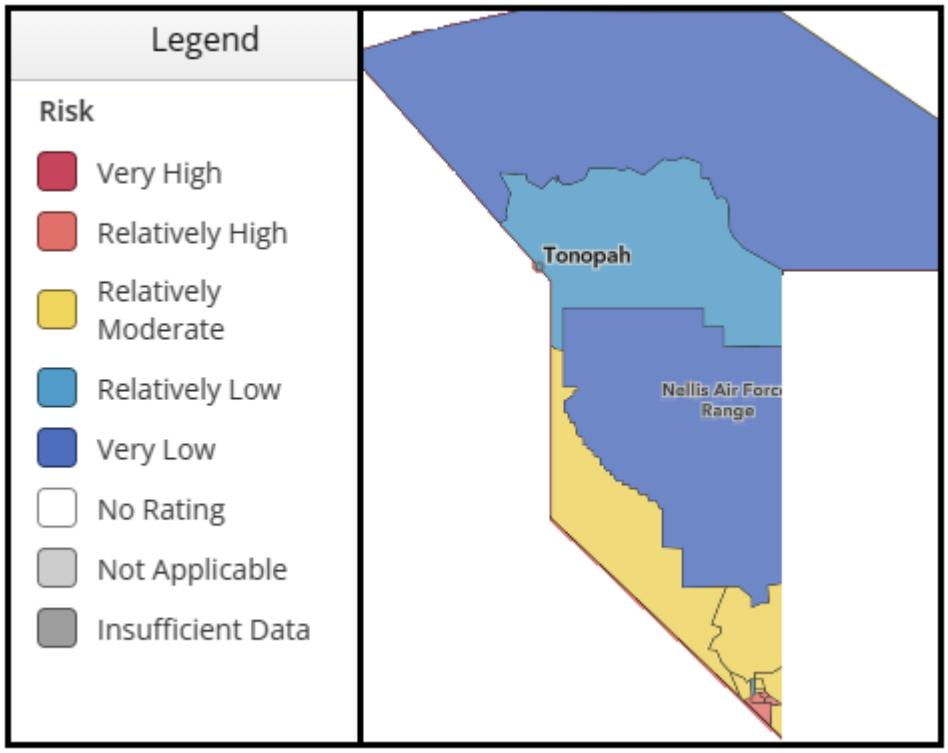
Map 13: Natural Hazard EAL for Nye County



Source: FEMA NRI

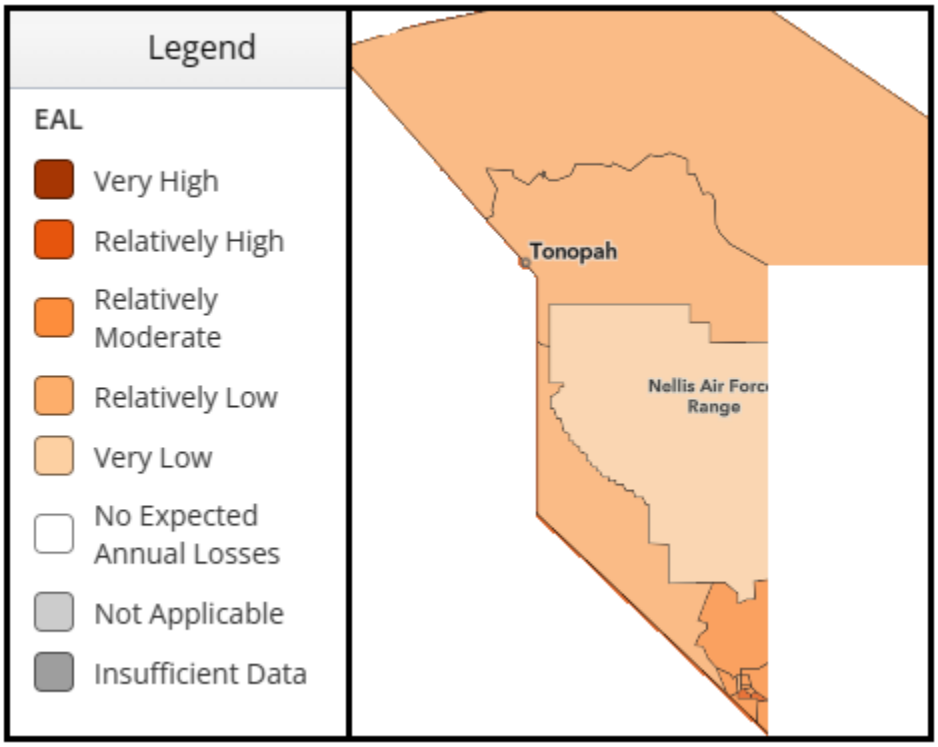
To help understand the risk and vulnerability to the identified hazards in this HMP for participating jurisdictions, risk index and EAL mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Map 14: Natural Hazard NRI by Jurisdiction for Nye County



Source: FEMA NRI

Map 15: Natural Hazard EAL by Jurisdiction for Calhoun County



Source: FEMA NRI

The following table, based on FEMA NRI analysis, indicates each participating jurisdiction's risk index for identified hazards.

Table 20: Nye County Identified Hazard FEMA Risk Index by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
All Hazards	Relatively Low	Relatively Moderate	Very Low	Relatively Low	Relatively Low
Dam Failure	No Rating	No Rating	No Rating	No Rating	No Rating
Drought	Very Low	Very Low	Relatively Low	Relatively Low	Relatively Low
Earthquake	Relatively Low	Relatively Moderate	Relatively Low	Relatively Moderate	Relatively Moderate
Extreme Heat	Relatively High	Very High	Relatively Moderate	Relatively Moderate	Relatively Moderate
Flood	Relatively Moderate	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low
Severe Thunderstorm	Very Low	Relatively Low	Relatively Low	Relatively Low	Relatively Low
Wildfire	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low
Winter Storms	Very Low	Relatively Low	Relatively Low	Relatively Moderate	Relatively Moderate

Source: FEMA NRI

The following table, based on FEMA EAL analysis, indicates each participating jurisdiction's estimated annual losses for identified hazards.

Table 21: Nye County Identified Hazard FEMA EAL by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
All Hazards	Relatively Low	Very Low	Very Low	Very Low	Very Low
Dam Failure	No Rating	No Rating	No Rating	No Rating	No Rating
Drought	Very Low	Very Low	Relatively Low	Relatively Low	Relatively Low
Earthquake	Relatively Low	Relatively Low	Relatively Low	Relatively Low	Relatively Low
Extreme Heat	Relatively High	Very High	Relatively Low	Relatively Low	Relatively Low
Flood	Relatively Low	Relatively Low	Relatively Low	Very Low	Very Low
Severe Thunderstorms	Very Low	Very Low	Very Low	Very Low	Very Low
Wildfire	Relatively Moderate	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low
Winter Storms	Very Low	Very Low	Very Low	Very Low	Very Low

Source: FEMA NRI

The following table details the estimated FEMA NRI valuation, population, and agricultural by census tract for Nye County:

Table 22: Nye County Identified Population and Valuation by Census Tract

Census Tract	Population	Building Valuation	Agricultural Valuation
960100	2,303	$677,903,707	$61,646,517
960200	2,322	$893,781,986	$5,549,217
960300	2,049	$784,272,611	$6,395,042
960405	4,552	$609,895,272	$0
960407	3,498	$633,527,554	$28,230
960408	5,493	$824,760,578	$0
960409	5,996	$952,228,875	$20,630

Table 22: Nye County Identified Population and Valuation by Census Tract

Census Tract	Population	Building Valuation	Agricultural Valuation
960410	5,607	$930,870,559	$180,239
960411	3,317	$474,965,702	$0
960412	3,965	$1,102,650,267	$0
960413	3,253	$491,651,980	$659,740
960414	2,749	$725,304,586	$41,910
960415	2,041	$260,836,640	$0
960416	4,021	$381,960,240	$0
980500	0	$35,241,628	$0

Source: FEMA NRI

Using the above FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building and agricultural valuation for each participating jurisdiction:

Table 23: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Jurisdiction		
	Population	Building Valuation	Agricultural Valuation
Amargosa Valley	480	$784,272,611	$6,395,042
Duckwater Shoshone Tribe	219	$338,951,854	$30,823,259
Pahrump	36,441	$7,423,893,881	$930,749
Round Mountain	933	$338,951,854	$30,823,259
Tonopah	2,179	$893,781,986	$5,549,217

Source: FEMA NRI and U.S. Census Bureau

Where appropriate, differences in vulnerability to identified hazards are noted in each individual hazard section.

4.6 Hazard Profiles

Each identified hazard is profiled in the subsequent sections, with the level of detail varying based on available information. Sources of information are cited in the detailed hazard profiles below. With each update of this plan, new information will be incorporated to provide for better evaluation and prioritization of the hazards.

Please note that as our tribal partners wanted their sacred sites to remain private, no information concerning the potential impact of a hazard related to a sacred site was completed. It can be generally assumed that none of the sites are at greater or lesser risk than any other area of the Tribal Reservation.

The following hazards are presented in alphabetical order, and not by planning significance, for ease of reference.

4.7 Dam Failure

4.7.1 Hazard Description

A dam is a barrier across flowing water that obstructs, directs, or slows down the flow, often creating a reservoir, lake, or impoundment. Most dams have a section called a spillway or weir, over or through, which water flows, either intermittently or continuously. Dams commonly come in two types, embankment (the most common) and concrete (gravity, buttress, and arch), as well as sizes. They also serve a number of purposes and provide essential benefits, including drinking water, irrigation, hydropower, flood control, and recreation.

Large or small, dams have a powerful presence that is frequently overlooked until a failure occurs. Dams fail in two ways: 1) a controlled spillway release done to prevent full failure, or 2) the partial or complete collapse of the dam itself. In each instance, an overwhelming amount of water, and potentially debris, is released. Dam failures are rare, but when they do occur, they can cause loss of life and immense damage to property, critical infrastructure, and the environment.

Possible reasons for dam failure include but are not limited to:

- Sub-standard construction materials/techniques
- Spillway design error
- Geological instability caused by changes to water levels during filling or poor surveying
- Sliding of a mountain into the reservoir
- Poor maintenance, especially of outlet pipes
- Human, computer, or design error
- Internal erosion, especially in earthen dams
- Earthquakes
- Terrorism

There are three classifications of dam failure, hydraulic, seepage, and structural. The following is an explanation of each these failure classifications:

- **Hydraulic:** This failure is a result of an uncontrolled flow of water over and around the dam structure as well as the erosive action on the dam and its foundation. The uncontrolled flow causing the failure is often classified as wave action, toe erosion, or gullying. Earthen dams are particularly susceptible to hydraulic failure because earthen materials erode more quickly than other materials, such as concrete and steel. This type of failure constitutes approximately 40% of all dam failures.
- **Seepage:** Seepage is the velocity of an amount of water controlled to prevent failure. This occurs when the seepage occurs through the structure to its foundation, where it begins to erode within. This type of failure accounts for approximately 4% of all dam failures.
- **Structural:** A failure that involves the rupture of the dam or the foundation by water movement, earthquake, or sabotage. When weak materials construct dams (large, earthen dams) are the primary cause of this failure. Structural failure occurs with approximately 30% of dam failures.

4.7.2 Location and Extent

The Nevada Department of Natural Resources oversees all dam safety programs. These programs are responsible for developing and maintaining an inventory of dams, classifying dams, and ensuring the compliance of all regulated dams.

Dams in the State of Nevada are ranked by Dam Hazard Classification, which is determined by the potential for infrastructure and property damage downstream if a dam failure were to occur. Current Dam Hazard Classifications are:

Table 24: Dam Hazard Potential Classification

Hazard Potential	Definition
High	The failure of a structure may cause the loss of life and serious damage to homes, industrial and commercial buildings, public utilities, major highways, or railroads.
Significant	The failure of a structure may damage isolated homes and highways or cause the temporary interruption of public utility services.
Low	The failure of a structure may damage farm buildings, agricultural land, or local roads.

Source: Nevada Department of Natural Resources

The U.S. Army Corps of Engineers National Inventory of Dams (NID) program indicates that there are 32 dams in Nye County, of which 29 are classified as low hazard. Additionally, the NID provides a condition assessment on each dam. The definition of dam condition assessment are as follows:

- **Satisfactory:** No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions in accordance with state engineer's rules and regulations for dams or tolerable risk guidelines.
- **Fair:** No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic incidents may result in a dam safety deficiency. Risk may be in the range to take further action.
- **Poor:** A dam safety deficiency is recognized for loading conditions, which may realistically occur. Remedial action is necessary. A poor condition is used when uncertainties exist as to critical analysis parameters, which identify a potential dam safety deficiency. Further investigations and studies are necessary.
- **Unsatisfactory:** A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

As low hazard dams were determined by the MPC to be of minimal concern, the following table details information concerning the two identified significant hazard dams within the county:

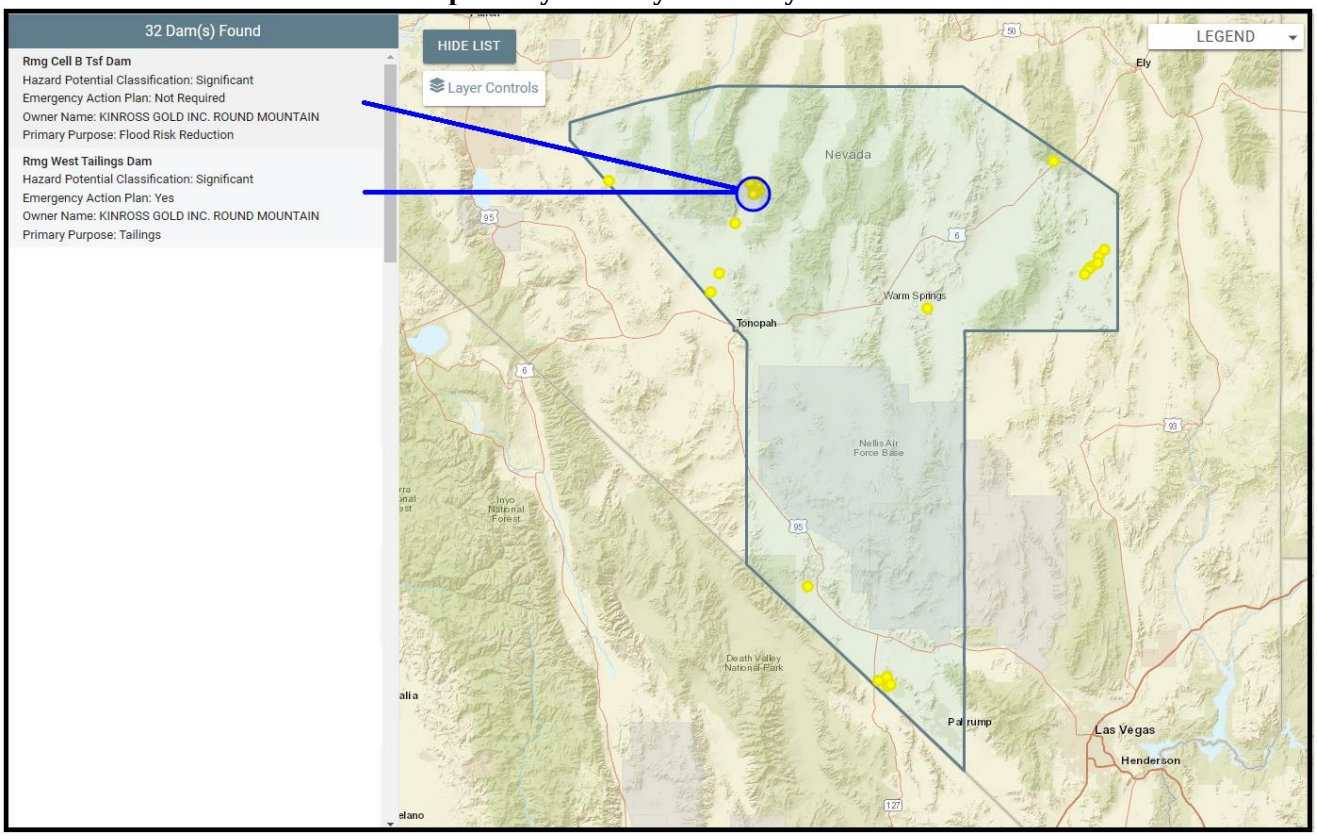
Table 25: Nye County Dams

Dam Name	NID ID	Nearest City (distance in miles)	River or Stream Name	Hazard Potential Classification	Condition Assessment (Date)	EAP Prepared
Rmg West Tailings Dam	NV10506	None	Unnamed Wash	Significant	Fair (10/21/2021)	Yes
Rmg Cell B Tsf Dam	NV10863	Carvers (5.5)	None	Significant	Fair (10/21/2021)	Not Required

Source: NID

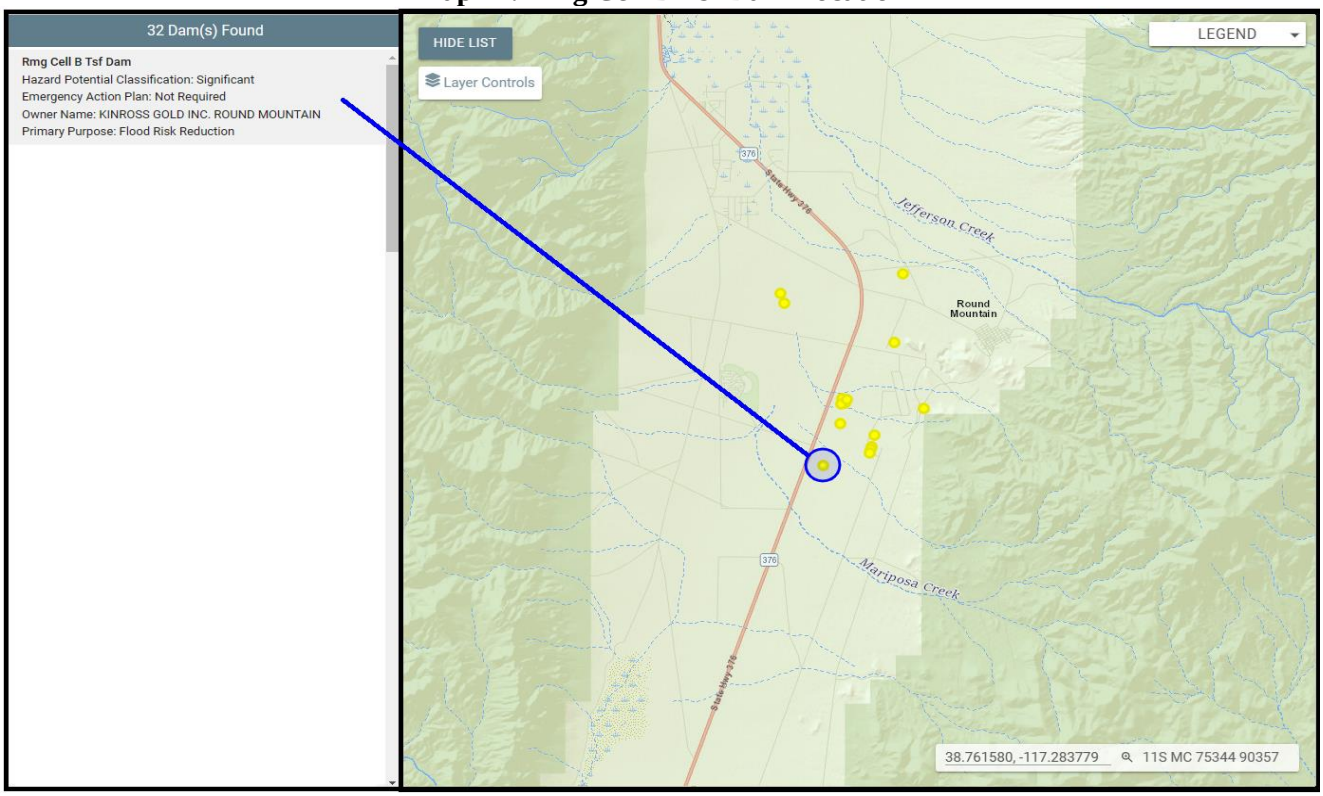
The following maps detail the locations of identified Significant Hazard dams in Nye County dams.

Map 16: Nye County Summary of Dams



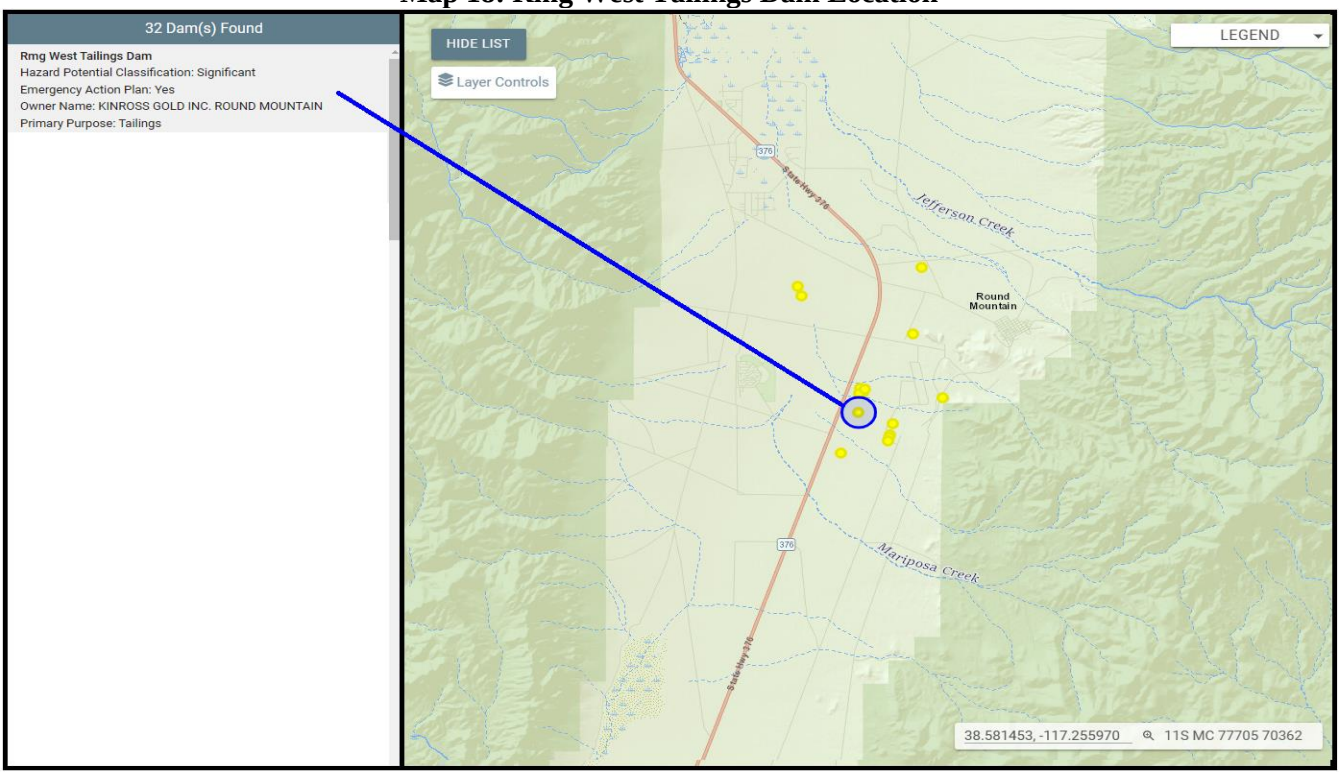
Source: NID

Map 17: Rmg Cell B Tsf Dam Location



Source: NID

Map 18: Rmg West Tailings Dam Location



Source: NID

No high or significant dams are identified in any participating jurisdiction. Additionally, no high or significant dams are identified on the Duckwater Shoshone Nation Reservation.

4.7.3 Previous Occurrences

There is no single, comprehensive source of open-source information about a dam failure in the State of Nevada. However, according to the Nevada State Hazard Mitigation Plan and information provided by MPC members, there have been no instances of dam failure in Nye County or on the Duckwater Shoshone Nation Reservation.

4.7.4 Probability of Future Incidents

As previously stated, there can be advanced warning to no warning at all for a dam failure event. At present, there is no history of a dam failure of any size in Nye County or its participating jurisdictions. In lieu of any historical events, the next best prediction tool would be based on the structural state of the dam. However, maintenance and structural information on the dams in Nye County and its participating jurisdictions is not available for public use. Available historic occurrence data suggests that there is a near zero percent probability of dam failure in a given year. However, it is important to note that the lack of past incidents does not protect against future incidents. The probability of a high hazard or significant hazard dam failure on the Duckwater Shoshone Nation Reservation is currently zero, as no dams of those classifications currently exist on or near the reservation.

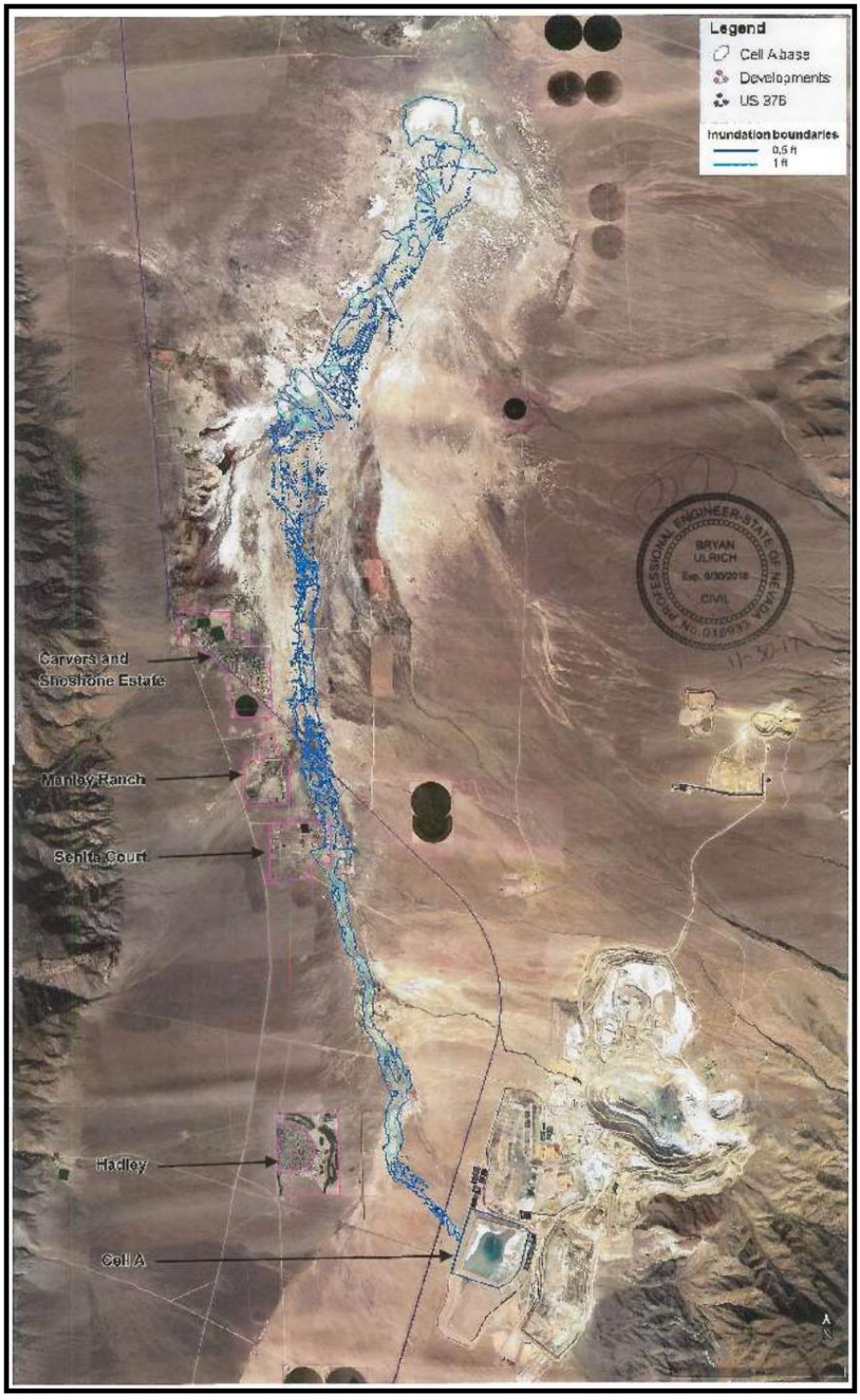
4.7.5 Vulnerability and Impact

The State of Nevada does not require Significant Hazard dams to have an Emergency Action Plan, which details potential dam failure inundation areas and at-risk structures identified. However, one of the two identified Significant Hazard dams within Nye County (Rmg West Tailings Dam) does have an Emergency Action Plan.

The following inundation map for Rmg West Tailings Dam was developed in October 2017. The water and tailings levels are modeled at permitted levels with a 24h-100-year storm event (2.47 in). The volume of slurry released is

assumed to be a mixture of solids and water, with 30% solids content by volume. Actual flooding areas will depend on the failure conditions during the flood emergency and may differ from the areas shown on the map.

Map 19: Rmg West Tailings Dam Inundation Areas



Source: Nye County

While an Emergency Action Plan has not been created for the Rmg Cell B Tsf Dam, the similar storage capacity of the Rmg Cell B Tsf Dam Location and the Rmg West Tailings Dam (28,450 acre/feet and 28,816 acre/feet, respectively), it is anticipated that the inundation zones would be similar.

It is worth noting that no communities or inhabited structures were identified in the reviewed inundation map. However, a county road does pass through an identified inundation area. The failure of a dam can have significant and wide-ranging impacts on road transportation infrastructure and critical components of transportation systems. Potential impacts may include:

- Flooding and Erosion: Dam failure can lead to rapid and extensive flooding, causing erosion of roadways and foundations. This can result in the collapse or significant damage to roads, disrupting transportation routes.
- Extended Downtime: The repair of transportation infrastructure can take a significant amount of time. During this period, transportation networks may be partially or entirely unavailable.

The cost to conduct maintenance on a road can vary significantly depending on the types of work required. However, the average estimate for repairs on a per mile basis in 2019 was $14,750 per mile. The cost to replace a road can vary significantly based on several factors, including the type of road, local labor and material costs, the complexity of the project, and the specific requirements of the replacement. As a rough estimate, road construction costs can range from $1,000,000 to $10,000,000 per mile.

The environmental impact of dam failures depends on the circumstances of the failure. After a dam failure occurs, the resulting flooding and moving debris can affect wildlife and natural habitats. The spread of pollution and hazardous materials can have negative impacts on the environment. Ecosystems and natural habitats may be destroyed, causing the migration or death of local wildlife. Depending on the timing and location of the failure, it can result in rapid changes in water temperature downstream. This can be harmful to temperature-sensitive aquatic species and ecosystems. Dam failures can disrupt natural ecological processes, such as nutrient cycling, sediment transport, and flow regimes. These disruptions can have cascading effects on ecosystems.

4.7.6 Potential Impact of Climate Change

As indicated by the United State Environmental Protection Agency's "What Climate Change Means for Nevada," Nye County is likely to see less available water for both storage and recreation. A warming climate will continue to decrease the snowpack, which has been steadily declining since the 1950s. Combined with the predicted decrease in annual rainfall, it is likely that smaller amounts of water will be available for storage in lakes and reservoirs (often behind dams). Additionally, the changing climate and resultant higher temperatures is likely to increase the rate of water usage while concurrently increasing evaporation from surface waters. As such, it is expected that the amount of water stored behind dams in Nye County will potentially decrease, lessening the potential impact of tis hazard.

4.7.7 Land Use and Development Trends

Any future development in identified or suspected inundation areas would increase the potential impact of this hazard. However, the generally static nature of the Nye County population during the past ten years indicates that future development will likely be minimal. Additionally, as there are no High Hazard dams (the failure of a structure may cause the loss of life and serious damage to homes, industrial and commercial buildings, public utilities, major highways, or railroads) in the county, it is unlikely that any future development or increase in population would increase any potential risk or vulnerability. The Duckwater Shoshone Nation has likewise seen minimal development, and future development is anticipated to be small of scale.

4.7.8 Jurisdictional Risk and Vulnerability

With the exception of the above delineated impacts of a potential significant hazard dam failure event on Nye County, specifically the impact on citizens driving on the county road passing through the identified inundation area of Rmg West Tailings Dam during a failure event, no citizens, infrastructure, or facilities of any participating jurisdiction are at risk to a dam failure event. There is no risk of an impactful dam failure to the Duckwater Shoshone Nation due to the lack of Significant or High Hazard dams on or near the Nation Reservation.

4.8 Drought

4.8.1 Hazard Description

Drought is defined as an abnormally dry period lasting months or years when an area has a deficiency of water and precipitation in its surface and or underground water supply. It is, however, a normal, seasonal, and recurrent feature of climate that occurs in virtually all climate zones—typically in late spring through early fall. The duration of drought varies widely. There are cases when drought develops relatively quickly and lasts a very short period of time, exacerbated by extreme heat and/or wind, and there are other cases when drought spans multiple years, or even decades. The hydrological imbalance can be grouped into the following non-exclusive categories:

- Agricultural: When the amount of moisture in the soil no longer meets the needs of previously grown crops
- Hydrological: When surface and subsurface water levels are significantly below their normal levels
- Meteorological: When there is a significant departure from the normal levels of precipitation
- Socio-Economic: When the water deficiency begins to significantly affect the population

When below average, little or no rain falls, soil can dry out, and plants can die. If unusually dry weather persists and water supply problems develop the period is defined as a drought. Human activity such as over-farming, excessive irrigation, deforestation, and poor erosion controls can exacerbate a drought's effects. It can take weeks or months before the effects of below average precipitation on bodies of water are observed. Depending upon the region, droughts can happen more quickly, noticed sooner, or have their effects naturally mitigated. The more humid and wet an area is, the faster the effects will be realized. A naturally dry region, which typically relies more on subsurface water will take more time to actualize its effects.

Periods of drought can have significant environmental, agricultural, health, economic, and social consequences. The effects vary depending upon vulnerability and regional characteristics. Droughts can also reduce water quality through a decreased ability for natural rivers and streams to dilute pollutants and increase contamination. The most common effects are diminished crop yield, increased erosion, dust storms, ecosystem damage, reduced electricity production due to reduced flow through hydroelectric dams, shortage of water for industrial production, and increased risk of wildland fires.

4.8.2 Location & Extent

Droughts are regularly monitored by multiple federal agencies using a number of different indices. Among them are the U.S. Drought Monitor, the Palmer Drought Index, and the Standardized Precipitation Index, as next described.

The U.S. Drought Monitor provides a summary of drought conditions across the U.S. and Puerto Rico. Often described as a blend of art and science, the map is updated weekly by combining a variety of data-based drought indices and indicators, along with local expert input, into a single composite drought indicator.

The Palmer Drought Index (PDI), devised in 1965, was the first drought indicator to assess moisture status comprehensively. It uses temperature and precipitation data to circulate water supply and demand, incorporates soil moisture, and is considered most effective for non-irrigated cropland. It primarily reflects long-term drought and has been used extensively to initiate drought relief.

Table 26: Palmer Drought Severity Index

Category	Range (Per Year)
Extremely Wet	4.0 or more
Very Wet	3.0 to 3.99

Table 26: Palmer Drought Severity Index

Category	Range (Per Year)
Moderately Wet	2.0 to 2.99
Slightly Wet	1.0 to 1.99
Incipient Wet Spell	0.5 to 0.99
Near Normal	0.49 to -0.49
Incipient Dry Spell	-0.5 to -0.99
Mild Drought	-1.0 to -1.99
Moderate Drought	-2.0 to -2.99
Severe Drought	-3.0 to -3.99
Extreme Drought	-4.0 or less

Source: U.S. Drought Monitor

The Standardized Precipitation Index (SPI) is a way of measuring drought that is different from the PDI. Like the PDI, this index is negative for drought, and positive for wet conditions. However, the SPI is a probability index that considers only precipitation, while PDI indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff).

Table 27: Standard Precipitation Index

Category	Range (Per Year)
Extremely Wet	2.0+
Very Wet	1.5 to 1.99
Moderately Wet	1.0 to 1.49
Near Normal	-.99 to .99
Moderately Dry	-1.0 to -1.49
Severely Dry	-1.5 to -1.99
Extremely Dry	-2 and less

Source: U.S. Drought Monitor

One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor, which lists weekly drought conditions for the State of Nevada. The following table details the U.S. Drought Monitor categories:

Table 28: U.S. Drought Monitor Categories

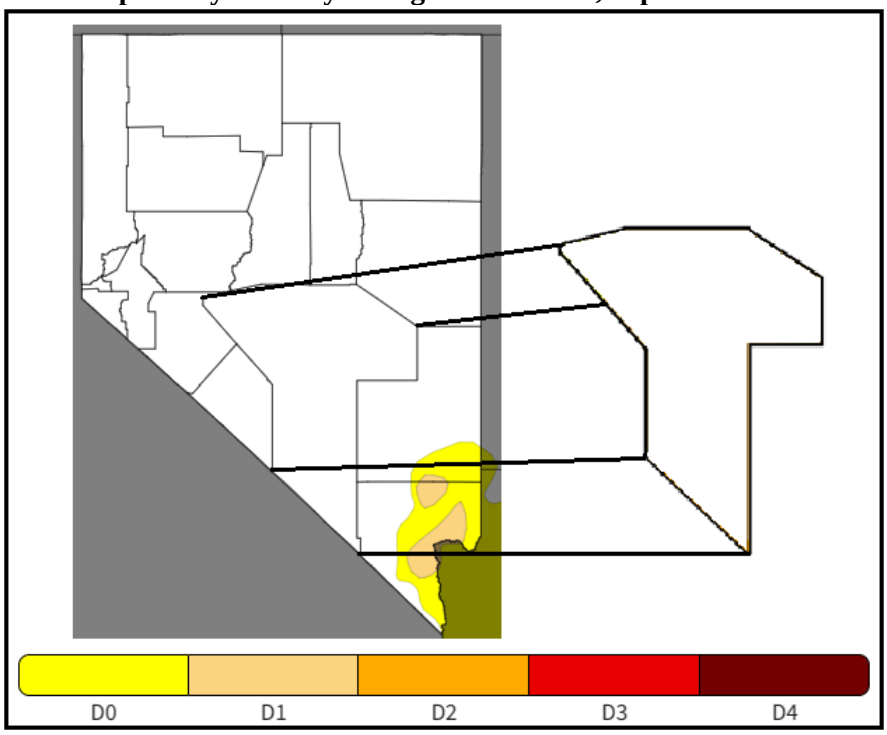
Rating	Described Condition
None	No drought conditions
D0	Abnormally Dry
D1	Moderate Drought
D2	Severe Drought
D3	Extreme Drought
D4	Exceptional Drought

Source: U.S. Drought Monitor

Drought can occur anywhere in Nye County, including all jurisdictions and the entire Duckwater Shoshone Nation Tribal Reservation.

As of this plan, all of Nye County is indicated to have no drought rating.

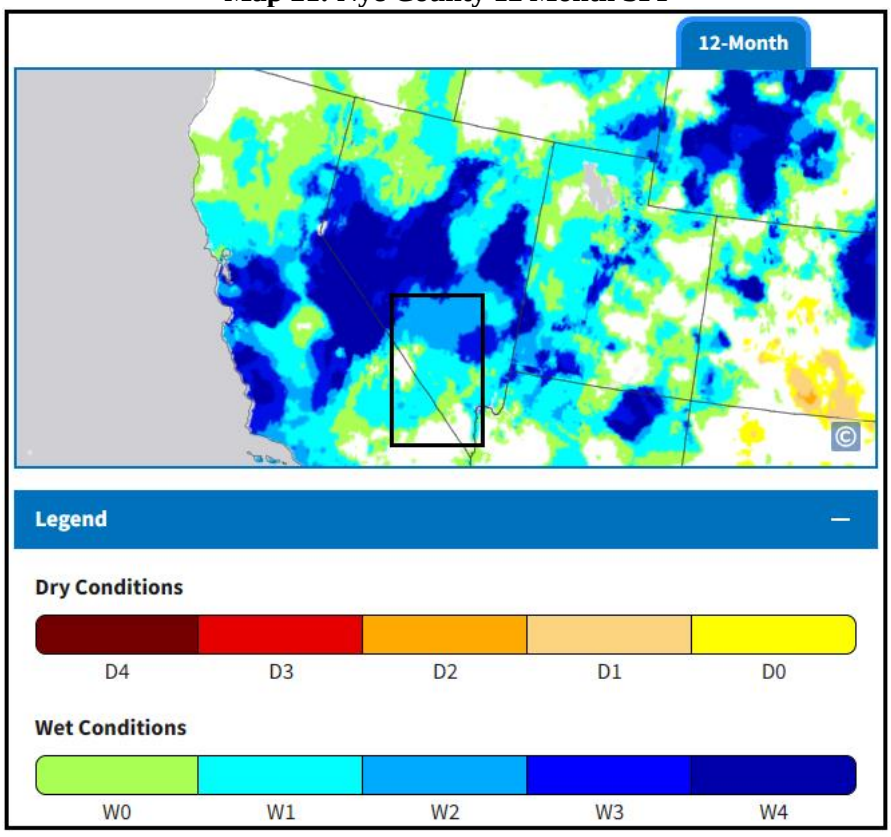
Map 20: Nye County Drought Conditions, September 2023



Source: U.S. Drought Monitor

The following map indicates the 12-month SPI for September 2023.

Map 21: Nye County 12 Month SPI



Source: NOAA

4.8.3 Previous Occurrences

Comprehensive data on droughts, drought impacts, and drought forecasting is extremely limited and often inaccurate. Due to the complexity of drought monitoring and the large areas droughts impact, agencies have difficulty quantifying and standardizing drought data.

One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor, which lists weekly drought conditions for the Nye County. Historical data was gathered from the U.S. Drought Monitor weekly reports for the 10-year period between 2013 and 2022 (with the years 2013 and 2022 being full dataset years). This data was compiled and aggregated to provide a yearly estimate of the percentage of Nye County in each Drought Monitor category.

Table 29: Percentage Area in U.S. Drought Monitor Category

Year	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2022	0.0%	100.0%	100.0%	99.8%	83.0%	27.3%
2021	0.0%	100.0%	100.0%	100.0%	99.2%	72.0%
2020	18.1%	81.9%	58.0%	41.8%	25.0%	1.8%
2019	65.2%	34.8%	14.6%	0.0%	0.0%	0.0%
2018	3.4%	96.6%	41.8%	0.0%	0.0%	0.0%
2017	67.5%	32.5%	3.4%	0.0%	0.0%	0.0%
2016	8.8%	91.2%	51.5%	15.1%	2.8%	0.0%
2015	0.0%	100.0%	100.0%	91.3%	38.9%	0.2%
2014	0.0%	100.0%	100.0%	89.1%	37.3%	0.0%
2013	0.0%	100.0%	100.0%	61.5%	5.3%	0.0%

Source: U.S. Drought Monitor

As a result of drought conditions, Nye County can potentially expect the following impacts for each of the identified drought monitor categories that have impacted the county over the last 10 years:

Table 30: Nye County Drought Impacts

Category	Historically Observed Impacts
D0	Low soil moisture
	Fire danger increase
D1	Livestock need supplemental feed and water
	Consideration of drought and water restrictions
D2	Dust storms occur
	Wildfire occurrence increase
	Well water decreases
D3	Fire danger is extreme
D4	Federal lands may close for fire precautions

This hazard is regional in nature, and occurrences for participating jurisdictions and the entire Duckwater Shoshone Nation Reservation are not unique from Nye County as a whole.

4.8.4 Probability of Future Events

Historically, drought has affected the Nye County region on a reoccurring basis. In reviewing historical data from the U.S. Drought Monitor weekly reports from January 2013 through December 2022 a yearly average can be created indicating the percentage of time in each Drought Monitor category. This average can be used to extrapolate the potential likelihood of future drought conditions.

Table 31: Estimated Probability of Nye County Being in U.S. Drought Monitor Category, Calendar Year

None	D0-D4	D1-D4	D2-D4	D3-D4	D4
16.3%	83.7%	66.9%	49.9%	29.2%	10.1%

Data: U.S. Drought Monitor

The probability of future occurrence is not unique to any participating jurisdiction, or the Duckwater Shoshone Nation Reservation, from Nye County as a whole.

4.8.5 Vulnerability and Impact

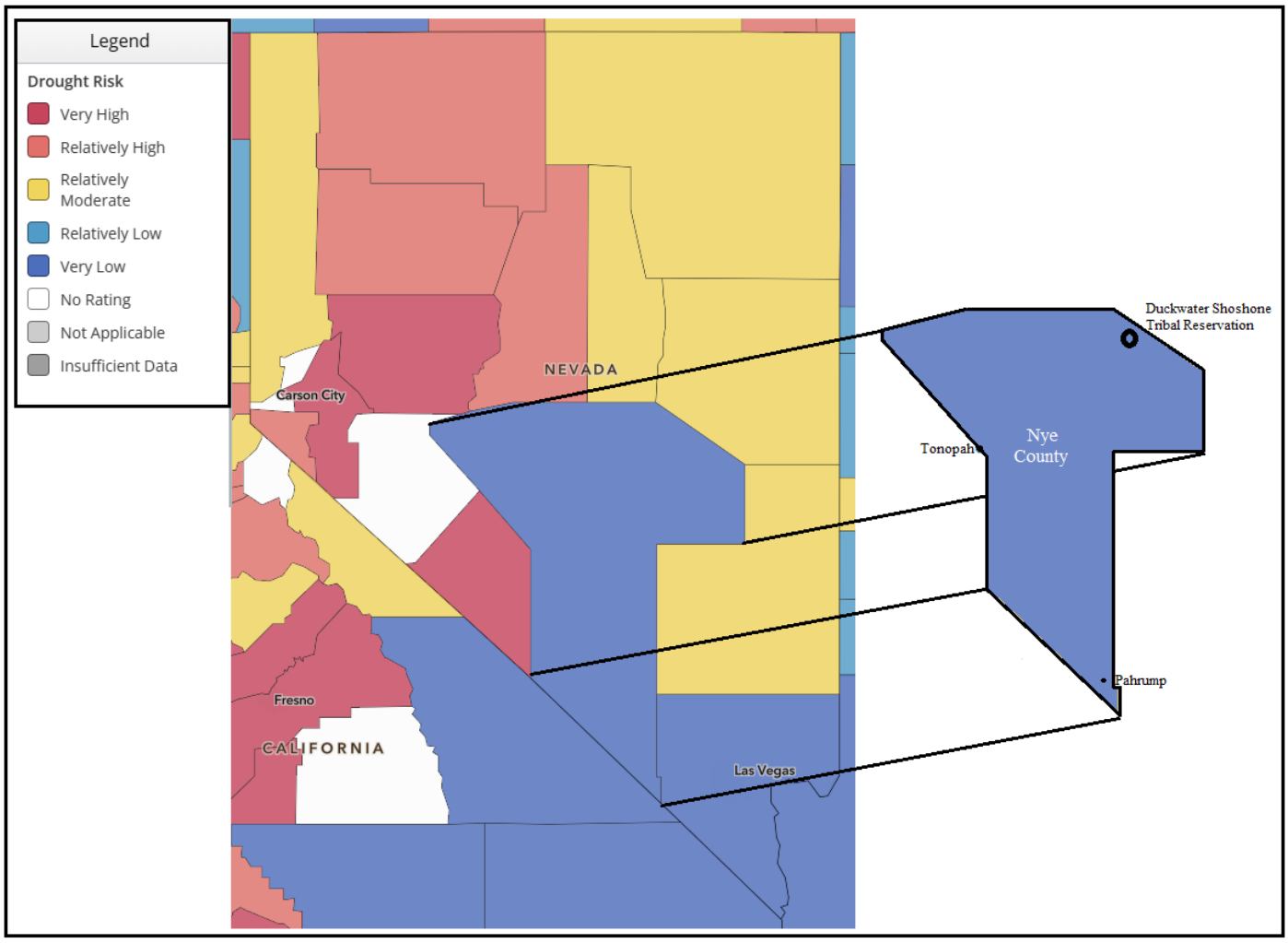
Droughts are rarely a direct cause of death, though the associated heat, dust, and stress can all contribute to increased mortality. However, drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. Water supply planning is the key to minimizing the effects of drought on the population. Public water suppliers should continue to work to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought.

Drought conditions can cause significant environmental and agricultural impacts. In addition to obvious losses in yields in both crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of wildfires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk. Although environmental losses are difficult to quantify, increasing public awareness and concern for environmental quality has forced public officials to focus greater attention n and resources on these effects. Environmental losses are the result of damage to plant and animal species, wildlife habitat, and air and water quality, wildfires, degradation of landscape quality, loss of biodiversity, and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from it if it is a temporary aberration. However, the degradation of landscape quality, with increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape.

County and local jurisdictional operations and facilities will likely experience minimal impacts from drought conditions, unless there are substantial power, communications, or water outages. However, reduced water availability would likely have an immediate impact on firefighting efforts in urban and suburban areas as fire suppression equipment requires a minimum level of water pressure to activate.

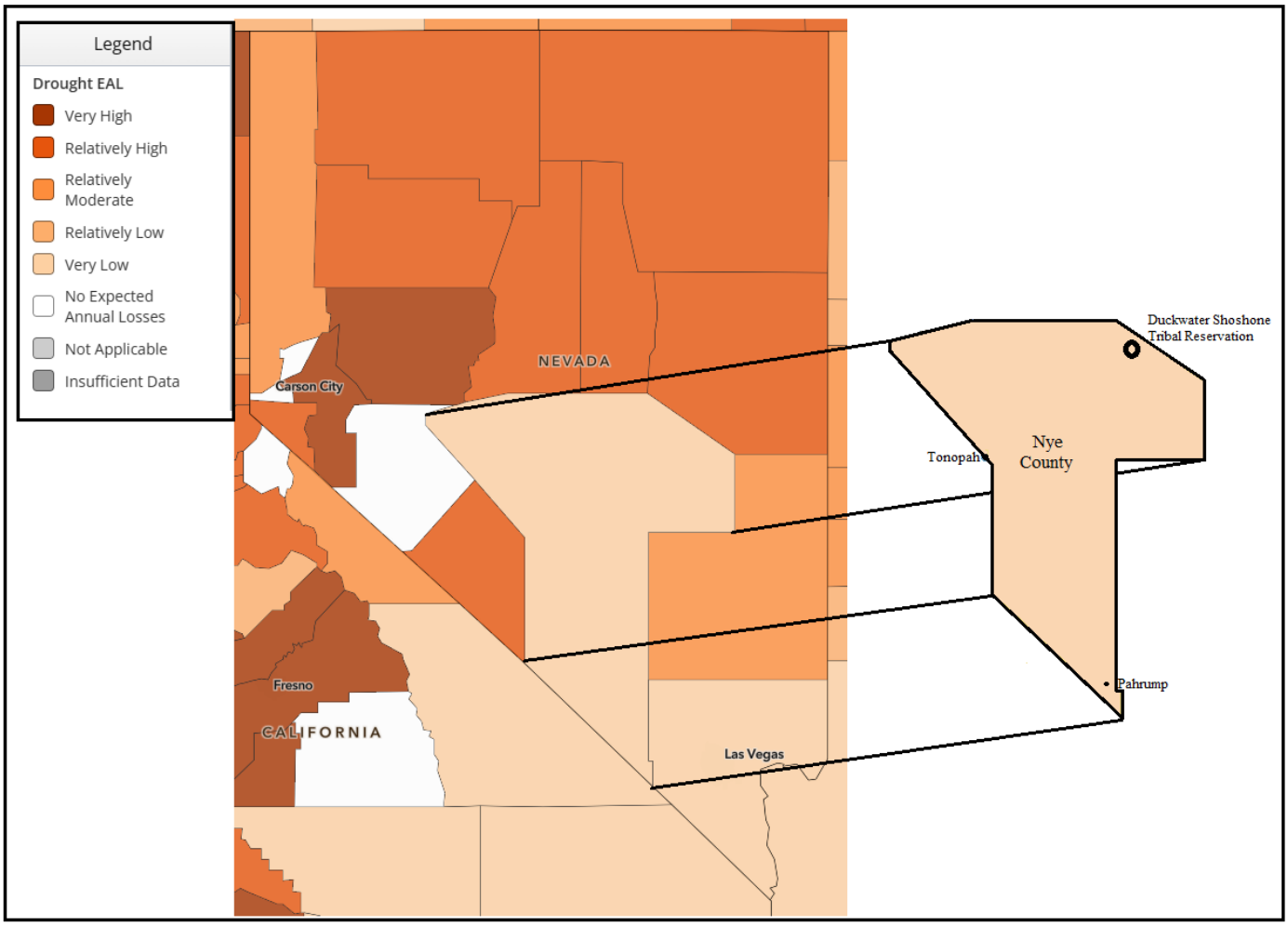
The following maps indicate both the NRI Risk Index and EAL for drought for Nye County:

Map 22: FEMA NRI Drought Risk



Source: FEMA NRI

Map 23: FEMA NRI Drought EAL



Source: FEMA NRI

4.8.6 Potential Impact of Climate Change

The Nevada State Climate Initiative fact sheet provides specific details about how climate change has already and will continue to impact the state of Nevada. It highlights historical trends and future projections for some major climate variables and how they may affect public health, water resources, the environment, hospitality and agriculture. The following table details how climate change will most likely impact the citizens of Nye County in relation to drought:

Table 32: Potential Impact of Climate Change, Drought

Area of Impact	Historical Trends
Public Health	Increased dust due to drying has impacts on respiratory illness. Drought has been shown to impact mental health.
Water Resources	Droughts lead to lower water supply and reduced water quality. They also increase demand for agricultural and household use, further stressing water resources.
Environment	Drought can negatively impact plant health and growth and can increase the potential for plant mortality. Low water levels and reduced plant growth can stress wildlife.
Recreation and Hospitality	Drought can limit many recreational opportunities, from snow sports to fishing and rafting.
Agriculture and Ranching	During drought, some water rights may not be fulfilled. Crop production may be reduced. Drought can reduce forage quantity and decrease range condition. These can lead to reductions in the use of federal lands for grazing.

Source: Nevada Climate Initiative

4.8.7 Land Use and Development Trends

Future development speaks to the potential impacts of land use and demographic changes in hazard prone areas. Data in this section is speculative, as future conditions are subject to numerous unpredictable factors. While past trends are used to inform the discussion, previous historical trends are no guarantee of future conditions.

As also indicated in the data above, Nye County and Pahrump have been seeing increasing population, with trends indicating continuing increases. These potential increases could increase the impact to their populations from a drought event from increased water demands. Conversely, all other participating jurisdictions, including the Duckwater Shoshone Nation, have been seeing generally static or declining populations. These potential declines could decrease the impact to their populations from a drought event from decreased water demands.

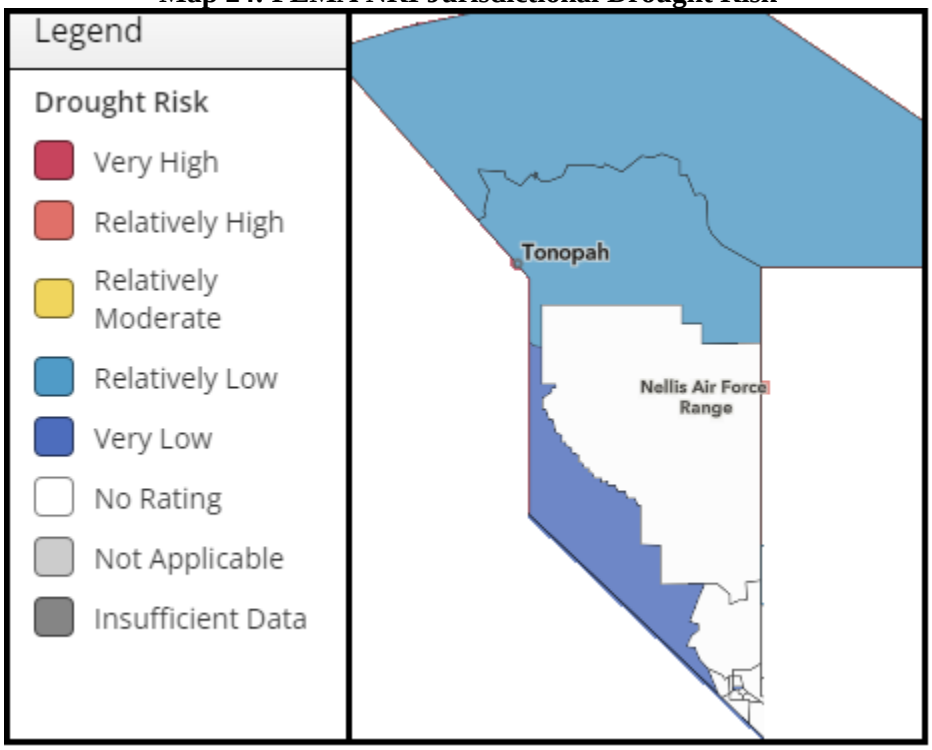
The agriculture base of Nye County is vulnerable to the short- and long-term effects of drought. Continued development in the agricultural sector would tend to increase both the exposure to, and damages from, a drought event. However, as indicated in the data above, Nye County has a very small agricultural base that minimizes future drought vulnerability.

4.8.8 Jurisdictional Risk and Vulnerability

To help understand the risk and vulnerability to drought conditions of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map was created indicating the potential risk to participating jurisdictions (as indicated by census tract) from drought:

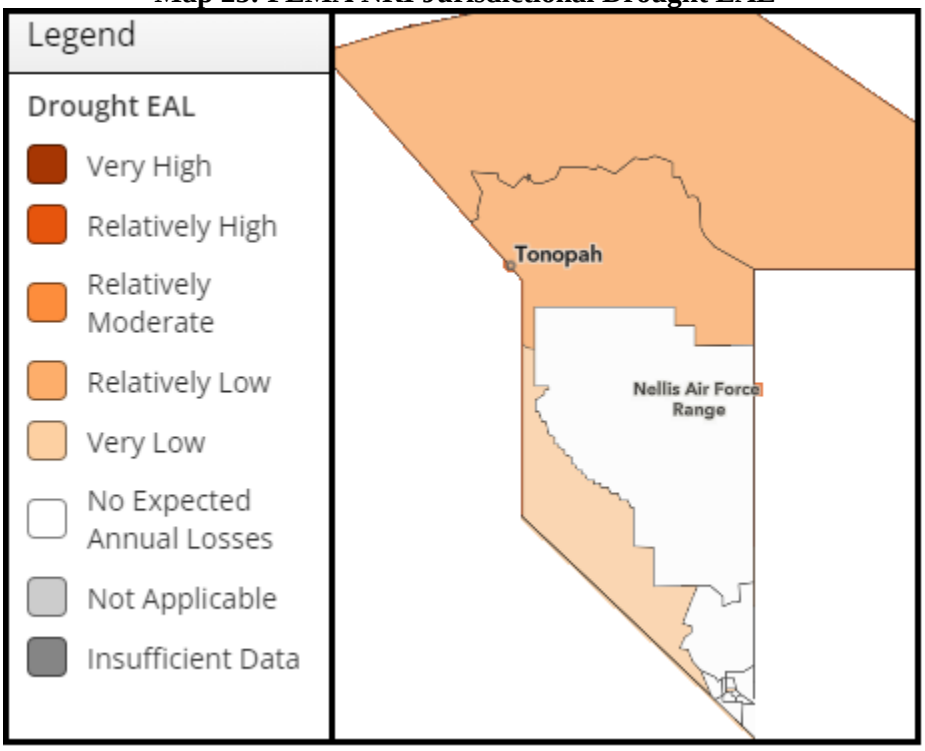
Map 24: FEMA NRI Jurisdictional Drought Risk



Source: FEMA NRI

As part of the NRI, EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk. The following map indicates the EAL for drought for participating jurisdictions (as indicated by census tract) within Nye County:

Map 25: FEMA NRI Jurisdictional Drought EAL



Source: FEMA NRI

The following table indicates the FEMA NRI and EAL analysis for each participating jurisdiction for drought:

Table 33: Nye County FEMA NRI and EAL for Drought by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Drought	Very Low	Very Low	Relatively Low	Relatively Low	Relatively Low
Drought	Very Low	Very Low	Relatively Low	Relatively Low	Relatively Low

Source: FEMA NRI

Potentially Vulnerable Community Lifelines

Certain facilities and assets such as infrastructure and community lifelines, have a net positive value on the community as they contribute to the public good by facilitating the basic functions of society. These facilities maintain order, public health, education, and help the economy function. Additionally, there are infrastructure and facilities integral to disaster response and recovery operations. Conversely, some infrastructure and facilities are of extreme importance due to the negative externalities created when they are impacted by a disaster. What fits these definitions will vary slightly from community to community, but the definitions remain as a guideline for identifying critical facilities and infrastructure.

Water utilities are particularly vulnerable to drought conditions due to the direct impact on water availability and supply. The May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 34: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Wastewater Services	$66
Loss of Water Services	$138

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

The following water utilities serve jurisdictions in Nye County:

Table 35: Nye County Water Utility Providers

Jurisdiction	Water/Sewer Utility
Amargosa Valley	None
Duckwater Shoshone Tribe	None
Pahrump	Great Basin Water Co., Desert Utilities Inc., Pahrump Utility Company
Round Mountain	Round Mountain Public Utilities
Tonopah	Tonopah Public Utilities

Water utilities can be affected by drought through:

- Reduced Water Availability: The reduction in water availability directly impacts the amount of water that water utilities can draw from local sources.
- Lower Reservoir Levels: Lower reservoir levels can affect the ability to meet water demand during periods of high usage.
- Declining Groundwater Levels: Lower groundwater levels make it more challenging for utilities to extract water.
- Water Quality Challenges: Lower water levels can lead to higher concentrations of contaminants, minerals, and sediments in the available water sources, requiring more extensive and costly treatment processes.
- Increased Treatment Costs: Treating water from depleted or lower-quality sources during drought conditions may require additional treatment steps, technologies, or chemicals, leading to increased operational costs for water utilities.
- Competition for Water Resources: During droughts, there is increased competition for limited water resources among various users, including agriculture, industry, and households. Water utilities may face challenges in securing sufficient water supplies amid this heightened competition.
- Impact on Water Infrastructure: Reduced water flow in rivers and streams can expose water infrastructure, such as pipelines, to the risk of corrosion.
- Water Use Restrictions: To conserve water during droughts, authorities may implement water use restrictions and conservation measures. These restrictions can impact water utilities' revenue and their ability to meet customer demand.

Drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. Water supply planning is the key to minimizing the effects of drought on the population. Public water suppliers should continue to work to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought.

Communities and citizens served by private wells rather than water supply districts may be at higher risk to drought conditions, and may see the following impacts:

- Lowering of Water Table: Drought conditions can lead to a lowering of the water table, which is the level at which groundwater is located. Private wells that rely on groundwater may experience reduced yields or, in extreme cases, may run dry.
- Decreased Well Recharge: Drought reduces the amount of precipitation, leading to decreased recharge of groundwater. Private wells depend on a sustainable recharge rate to maintain a consistent and reliable water supply.

- Increased Competing Demands: During a drought, increased water demand for agricultural irrigation, municipal water supply, and other uses can create competition for the available groundwater. Private wells may face challenges due to this increased demand.
- Water Quality Concerns: Lower groundwater levels during droughts can lead to changes in water quality. Concentrations of minerals, contaminants, and pollutants may increase, affecting the suitability of water for drinking and other uses.

Should it be required to drill a private well deeper to accommodate for drought conditions impacting the level of the water table, on average, the cost to drill a private water well in the United States can range from $15 to $45 per foot. However, it's important to note that this is a general estimate, and actual costs can vary based on geological and hydrogeological conditions and well depth.

Using the above FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building and agricultural valuation for each participating jurisdiction:

Table 36: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Jurisdiction		
	Population	Building Valuation	Agricultural Valuation
Amargosa Valley	480	$784,272,611	$6,395,042
Duckwater Shoshone Tribe	219	$338,951,854	$30,823,259
Pahrump	36,441	$7,423,893,881	$930,749
Round Mountain	933	$338,951,854	$30,823,259
Tonopah	2,179	$893,781,986	$5,549,217

Source: FEMA NRI and U.S. Census Bureau

At greater risk may be the vulnerable populations of each participating jurisdiction, including the especially young, the elderly, and those below the poverty level. Hazard occurrences can exacerbate existing vulnerabilities and create new challenges. Vulnerable populations may have pre-existing health conditions that make them more susceptible to heat-related illnesses and dehydration, both of which can be exacerbated during droughts. Limited mobility or access to medical care can also increase their vulnerability. Persons on fixed incomes and with limited resources may face difficulties in adapting their homes to withstand hazard conditions or may lack financial resources to cope with the increased costs of food, water, and energy.

The following table details potentially vulnerable populations by participating jurisdictions:

Table 37: Nye County Potential at Risk Population Data

	Population 5 and Under (2020)	Population Over 65 (2020)	Speak a Language Other Than English (2020)	Estimated People in Poverty (2020)
Nye County	858 (1.7%)	7,515 (14.6%)	6,243 (12.1%)	8,048 (15.6%)
Amargosa Valley	115 (10.8%)	257 (24.2%)	455 (42.8%)	586 (55.1%)
Beatty	0 (0.0%)	248 (32.5%)	84 (11.0%)	162 (21.3%)
Gabbs	70 (37.6%)	45 24.2%)	0 (0.0%)	0 (0.0%)
Pahrump	1,906 (4.3%)	13,405 (30.0%)	5,100 (11.4%)	6,442 (14.4%)
Round Mountain	160 (17.1%)	126 (13.5%)	79 (8.5%)	108 (11.6%)
Tonopah	18 (0.8%)	745 (34.2%)	190 (8.7%)	418 (19.2%)
Duckwater Shoshone	30 (13.7%)	50 (22.8%)	60 (27.5%(	75 (34.2%)

Source: United States Census Bureau 2020

4.9 Earthquake

4.9.1 Hazard Description

An earthquake is the result of a sudden release of energy in the Earth's crust that creates seismic waves that are typically caused by the rupturing of geological faults. A fault is a fracture or zone of fractures between two blocks of rock. Faults allow the blocks to move relative to each other, which, when rapidly occurring, causes an earthquake. When stresses in the crust exceed the strength of the surrounding rock, a rupture or break may occur fault plane. The point of origin of an earthquake is known as the hypocenter, which may be deep beneath the surface. The point at the surface directly above the hypocenter is known as the epicentre. Seismic waves radiate out from the hypocenter causing the ground to shake. These waves can travel long distance, but in general are strongest near the epicenter.

4.9.2 Location and Extent

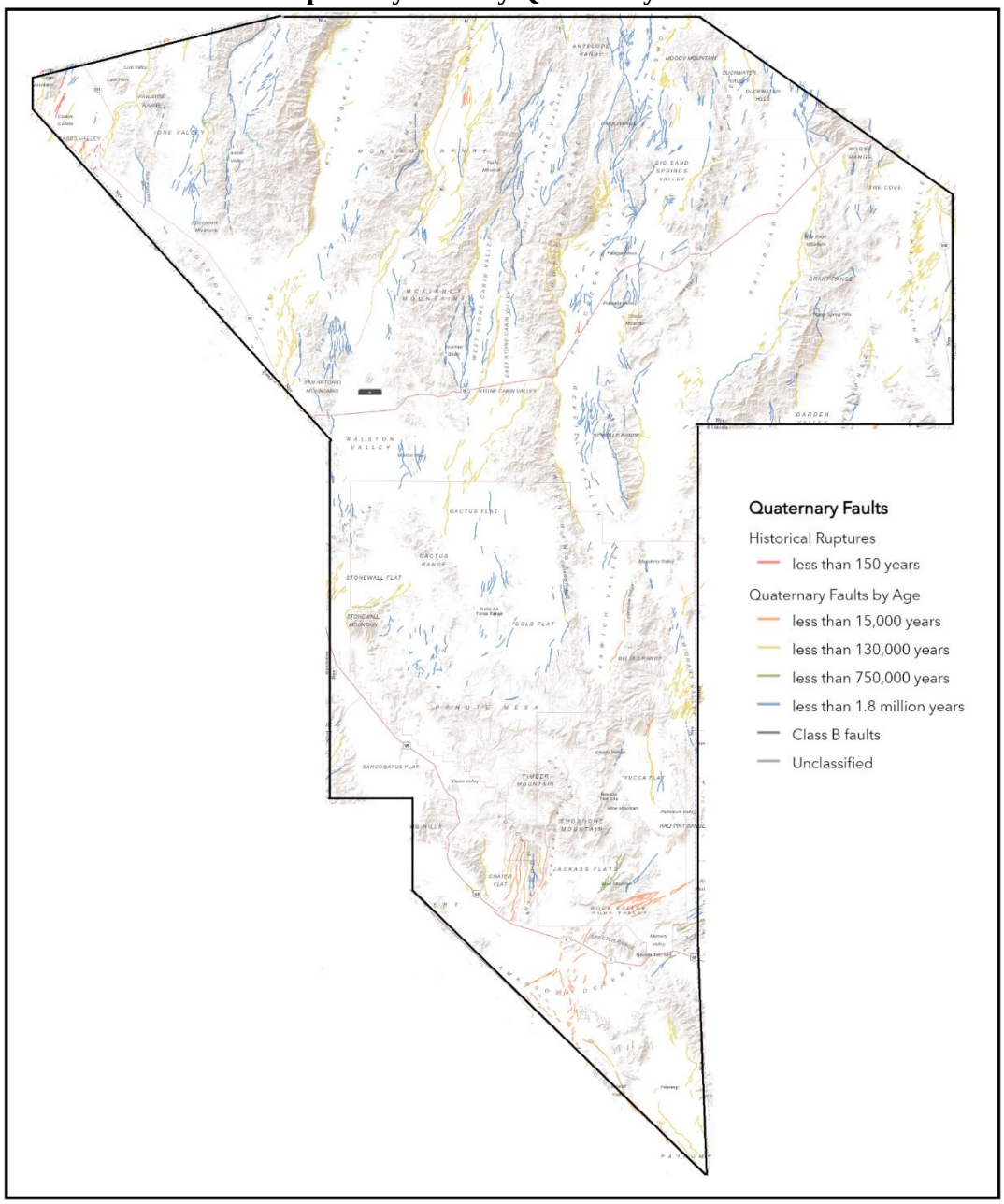
Nevada is one of the most seismically active states in the country. Nye County is located near the boundary between the Pacific Plate and the North American Plate. This boundary is responsible for much of the seismic activity in California and Nevada.

Many faults have been identified within Nye County, of varying sizes and earthquake causing potential. Identified faults within Nye County include:

- Rocky Valley Fault
- Pahranagat Fault
- Cane Spring Fault
- Timpahute Fault
- Frenchman Mountain Fault
- Whitney Mesa Fault
- Cashman Fault
- Decatur Fault
- Eglington Fault
- West Charleston Fault
- Pahrump Valley Fault
- Death Valley Fault
- Furnace Creek Fault

The following map, from the Nevada Bureau of Mines and Geology, details Quaternary fault locations within the county. A Quaternary fault is one that has been recognized at the surface and that has moved in the past 1,600,000 years (within the Quaternary Period).:

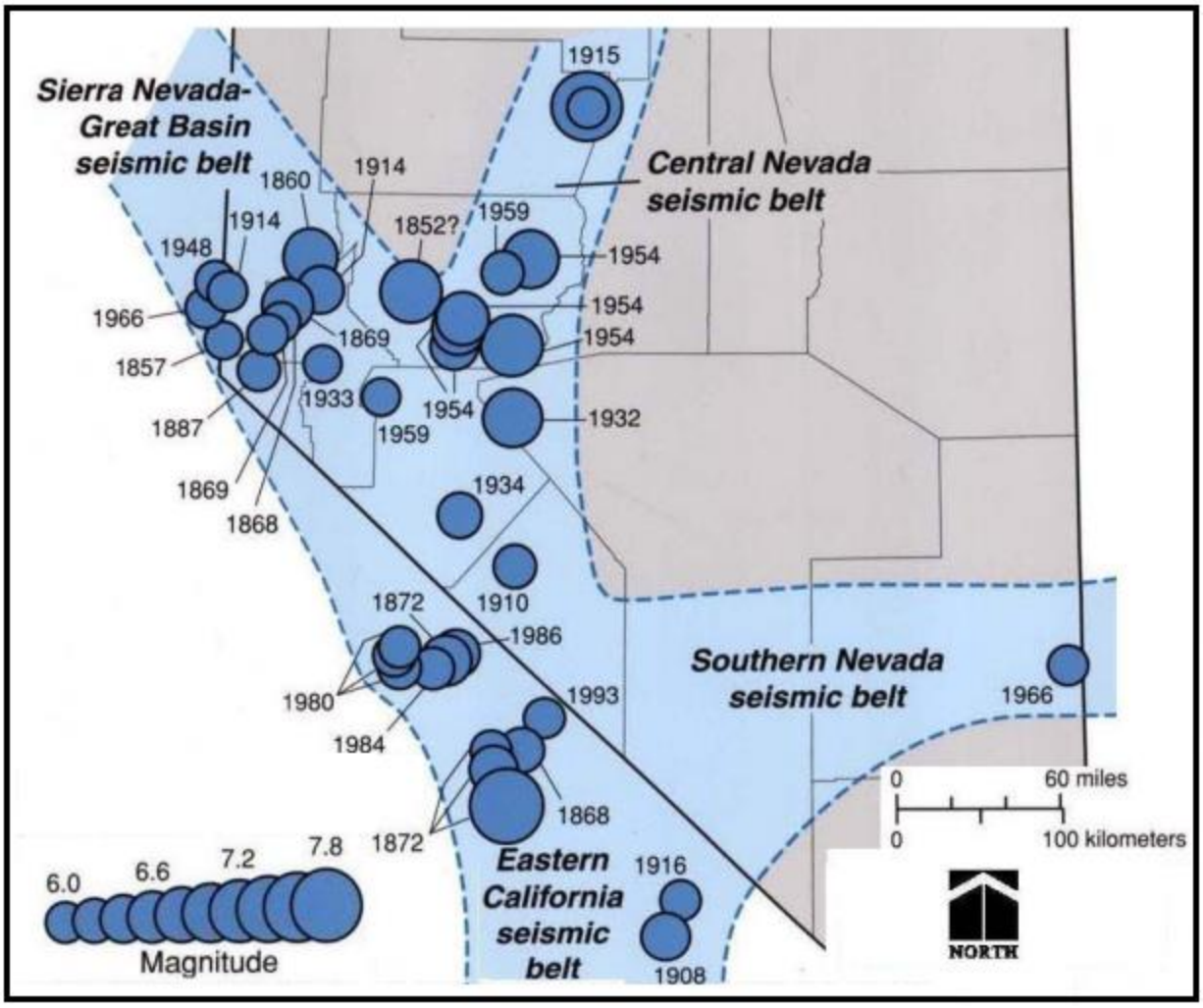
Map 26: Nye County Quaternary Faults



Source: Nevada Bureau of Mines and Geology

The following map, from Nye County, details regional seismic belts and major historic earthquakes:

Map 27: Regional Major Earthquakes and Seismic Belts



Source: Nevada Bureau of Mines and Geology

Two scales are used when referring to earthquake activity. Estimating the total force of an earthquake is the Richter scale, and the observed damage from an earthquake is the Modified Mercalli Intensity Scale. Additionally, both Acceleration (%g) and Velocity (cm/s) can be used to measure and quantify force and movement.

The following table equates the above referenced earthquake scales:

Table 38: Earthquake Magnitude Scale Comparison

Mercalli Scale Intensity	Verbal Description	Richter Scale Magnitude	Acceleration (%g)	Velocity (cm/s)	Witness Observations
I	Instrumental	1 to 2	0.17%	<0.1	None
II	Feeble	2 to 3	1.40%	1.1	Noticed only by sensitive people
III	Slight	3 to 4	1.40%	1.1	Resembles vibrations caused by heavy traffic
IV	Moderate	4	3.90%	3.4	Felt by people walking; rocking of free-standing objects
V	Rather Strong	4 to 5	9.20%	8.1	Sleepers awakened; bells ring
VI	Strong	5 to 6	18.00%	16	Trees sway, some damage from falling objects

Table 38: Earthquake Magnitude Scale Comparison

Mercalli Scale Intensity	Verbal Description	Richter Scale Magnitude	Acceleration (%g)	Velocity (cm/s)	Witness Observations
VII	Very Strong	6	34.00%	31	General alarm, cracking of walls
VIII	Destructive	6 to 7	65.00%	60	Chimneys fall and some damage to building
IX	Ruinous	7	124.00%	116	Ground crack, houses begin to collapse, pipes break
X	Disastrous	7 to 8	>124.0%	>116	Ground badly cracked, many buildings destroyed. Some landslides
XI	Very Disastrous	8	>124.0%	>116	Few buildings remain standing, bridges destroyed.
XII	Catastrophic	8 or greater	>124.0%	>116	Total destruction; objects thrown in air, shaking and distortion of ground

Earthquakes can occur anywhere in Nye County, including all jurisdictions and the entire Duckwater Shoshone Nation Tribal Reservation.

4.9.3 Previous Occurrences

Since records have been kept, Nye County has experienced two greater than 5.0 Richter Scale intensity earthquakes within the county borders. These earthquakes are as follows:

Table 39: Nye County Major Earthquakes, 1872 - 2022

Event Date	Location	Richter Scale Magnitude	Deaths/Injuries
06/29/1992	Little Skull Mountain	5.6	0
08/01/1999	Scotty's Junction	5.7	0

Source: University of Nevada, Reno and Nevada Bureau of Mines and Geology

Additionally, several large magnitude earthquakes have occurred within the region. These include the February 21, 2008 Wells earthquake (magnitude 6.0), the July 6, 1954 Fairview Peak Earthquake (magnitude 7,1), and the December 20, 1932 Cedar Mountain earthquake (Magnitude 7.1)

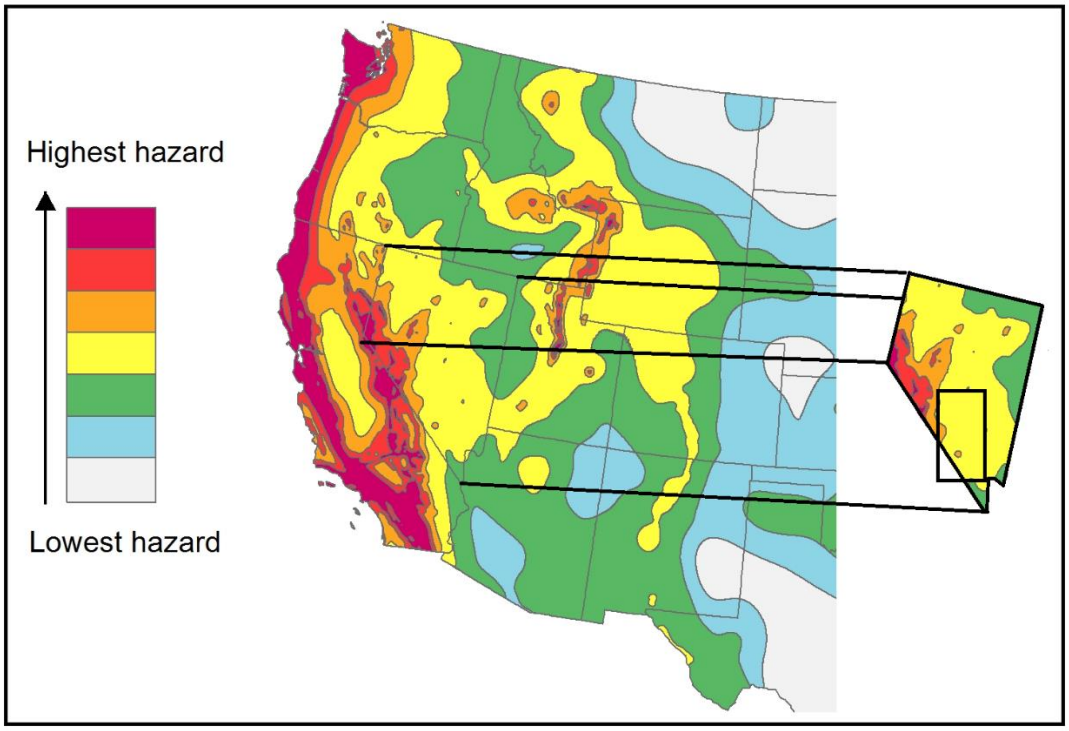
This hazard is regional and widespread in nature, and occurrences for participating jurisdictions and the entire Duckwater Shoshone Nation Reservation are not unique from Nye County as a whole.

4.9.4 Probability of Future Events

Predicting the occurrence of earthquakes is tremendously challenging due to the large number of factors involved. However, mapping from the USGS can help detail future earthquake probability.

The following map, from the USGS, illustrates potential earthquake hazard for the county.

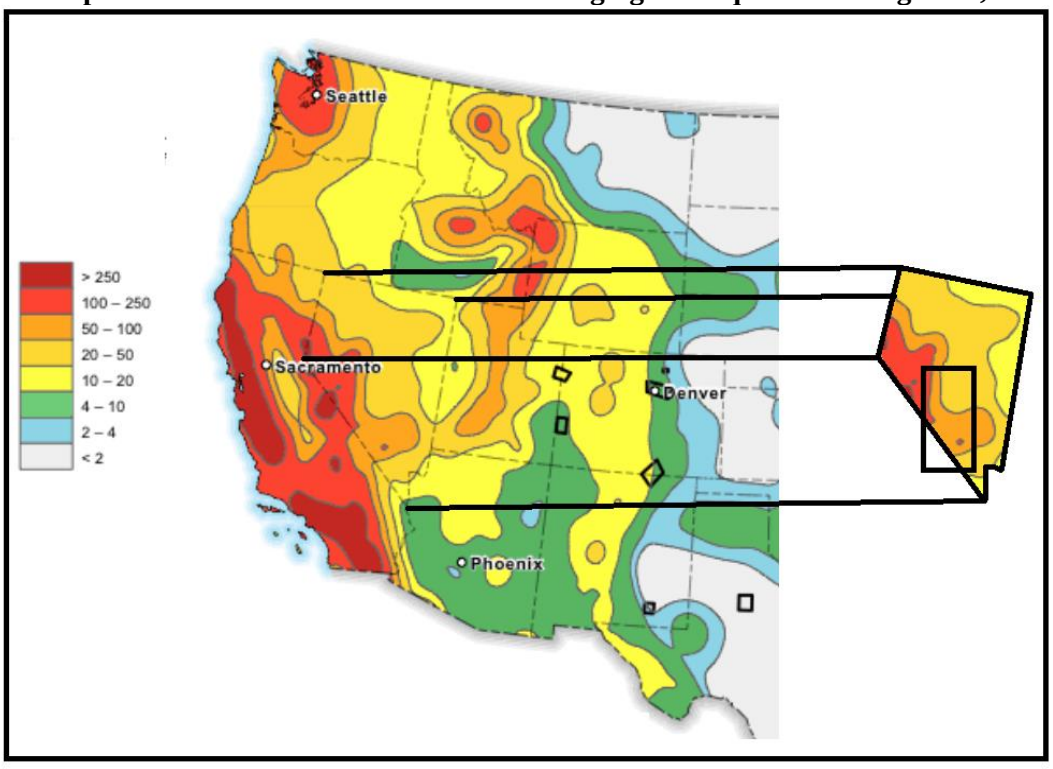
Map 28: USGS Nye County Earthquake Hazard Map



Source: USGS

The following map, from the USGS, illustrates the expected number of an earthquake exceeding a Modified Mercalli Intensity of level VI.

Map 29: Expected Number of Occurrences or Damaging Earthquake Shaking in 10,000 Years



Source: USGS

Additionally, the University of Reno and the Nevada Bureau of Mines and Geology indicate the following percentage risk of experiencing an earthquake for select Nye County jurisdictions:

Table 40: FEMA HAZUS Probability of Earthquake

Community	Richter Scale 5.0	Richter Scale 5.5	Richter Scale 6.0	Richter Scale 6.5	Richter Scale 7.0
Gabbs	90%	~65%	40 - 50%	20 - 25%	6 - 8%
Beatty	70 - 80%	~55%	30 - 40%	20 -30%	10 - 12%
Tonopah	70 - 80%	~50%	20 – 30%	5 - 10%	<1%
Pahrump	30 - 40%	~25%	5 - 10%	3%	<1%

Source: University of Nevada, Reno and Nevada Bureau of Mines and Geology

The probability of a future occurrence of this hazard is not unique to any participating jurisdiction, or the Duckwater Shoshone Nation Reservation, from Nye County as a whole.

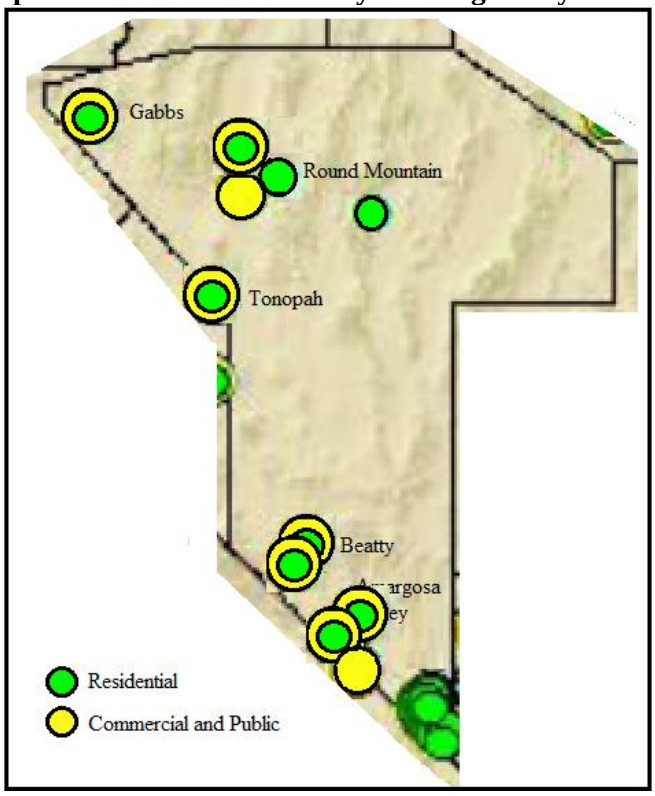
4.9.5 Vulnerability and Impact

All participating jurisdictions are at risk to the potential impacts of an earthquake. FEMA's HAZUS-MH was used to conduct a loss estimation from a magnitude 6.6 Frenchman Mountain quake. The damage estimate indicated the following:

- Approximately 144 buildings will be at least moderately damaged.
- No buildings will be damaged beyond repair
- Building losses will be $5,530,000, of which 22% is related to business interruption
- There will be minimal damages to transportation and utility infrastructure

Of particular concern to all jurisdictions are unreinforced masonry buildings. An unreinforced masonry building is constructed of brick or masonry with no steel reinforcing bars. Because these buildings were not built using modern building codes, they are much more likely to experience damage or collapse during an earthquake. Surveys conducted by the Nevada Bureau of Mines and Geology estimate that Nye County has approximately 372 unreinforced masonry buildings. The following map indicates the locations of these buildings, with the large majority being in Pahrump.

Map 30: Unreinforced Masonry Buildings in Nye County



Source: Nevada Bureau of Mines and Geology

Recent earthquakes worldwide depict a pattern of steadily increasing damage and losses that are due to significant growth in earthquake-prone urban areas and vulnerability of older building stock, including buildings constructed within the past 20 years. In 2017 FEMA released the Hazus Estimated Annualized Earthquake Losses for the United States that reported recent earthquakes show a pattern of steadily increasing damages and losses due to:

- Significant growth in earthquake-prone urban areas
- Vulnerability of the older building stock

Data in the report details the Annualized Earthquake Loss (AEL) measures, the annualized earthquake losses in any single year, and the Annualized Earthquake Loss Ratio (AELR), which addresses seismic risk in relation to the value of the buildings in the study area. In order to calculate the AELR the AEL were divided by building replacement values. The report notes that Nye County can expect:

- Annualized Earthquake Losses at $500,000 to $1,000,000
- Annualized Earthquake Loss Ratio of 100 - 500 ($/million $)

The Hazus Estimated Annualized Earthquake Losses for the United States report also notes that Rhode Island can expect:

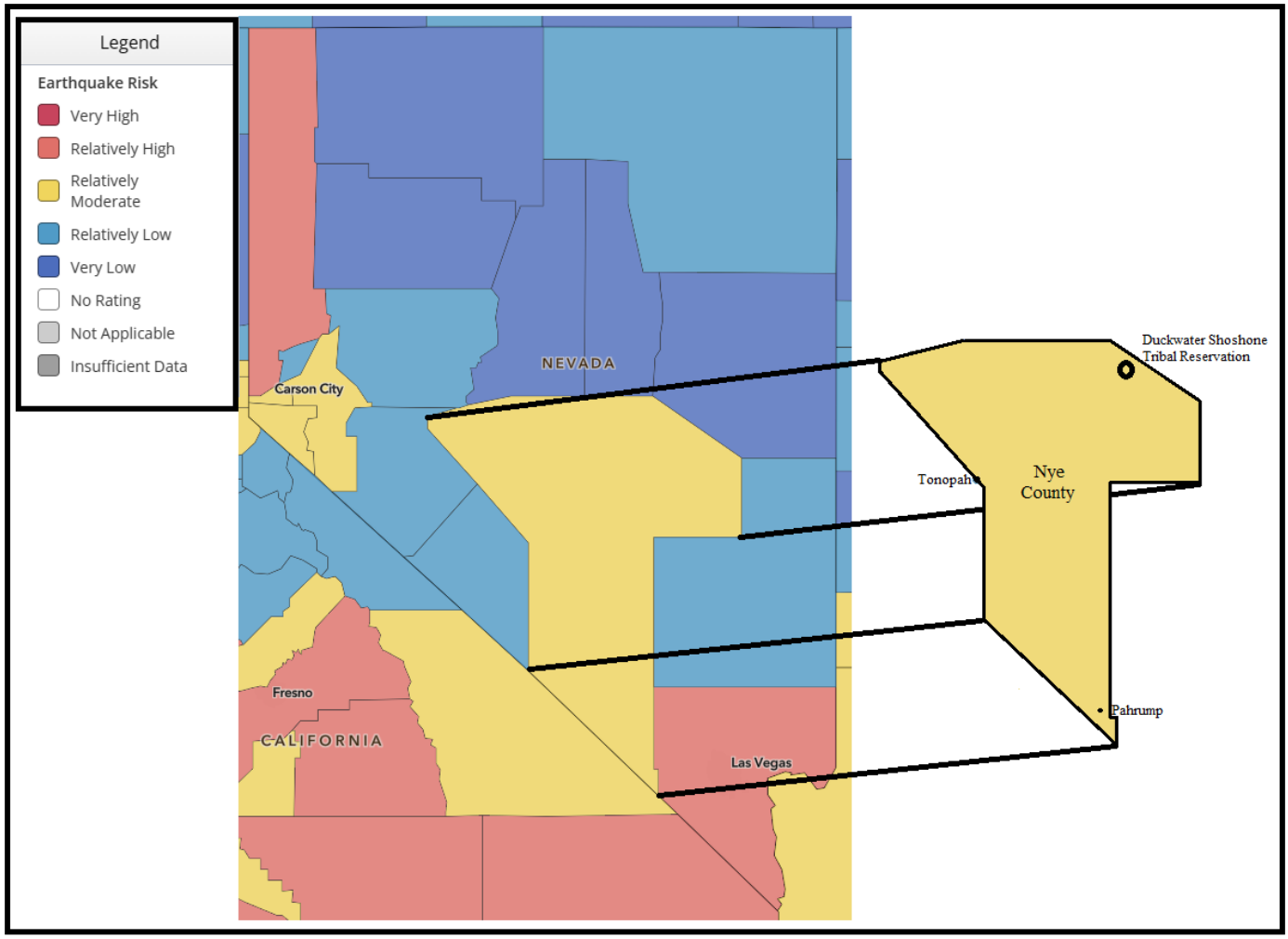
- Up to 10,000 tons of debris from an estimated 250-year event
- Up to 100,000 tons of debris from an estimated 1,000-year event
- 15 people requiring short term shelter from an estimated 250-year event
- 150 people requiring short term shelter from an estimated 1,000-year event

The risk to county and local jurisdictional operations and facilities from earthquakes can vary significantly depending on the location and the level of seismic activity. Potential risks to operations and buildings from earthquakes include:

- Structural Damage: Earthquakes can cause significant structural damage to government buildings, including state capitol buildings, offices, and infrastructure such as bridges and roads. The extent of damage depends on the earthquake's magnitude, depth, and proximity to populated areas.
- Injury and Loss of Life: Earthquakes can result in injuries and loss of life among government employees, particularly if buildings are not constructed to withstand seismic forces or if there are insufficient emergency evacuation plans and procedures in place.
- Disruption of Government Operations: Earthquakes can disrupt the normal functioning of government operations. Damaged buildings may need to be evacuated or temporarily closed for repairs, which can affect the delivery of services.
- Communication Disruptions: Seismic activity can damage communication infrastructure, including telephone lines and data networks. This can hinder the ability to communicate internally and with the public during and after an earthquake.
- Power Outages: Earthquakes can lead to power outages by damaging electrical infrastructure such as substations and power lines. Government buildings may lose power, affecting critical operations and services.
- Loss of Records and Data: Earthquakes can result in the loss of important records and data stored in government buildings. This can have legal and operational implications.
- Emergency Response: Government agencies may need to activate emergency response plans, deploy first responders, and coordinate relief efforts in the aftermath of a significant earthquake.
- Budgetary Impact: The costs associated with repairing and retrofitting government buildings and infrastructure after an earthquake can be substantial and may strain budgets.

The following map indicates the FEMA NRI Risk Index for Nye County for earthquakes:

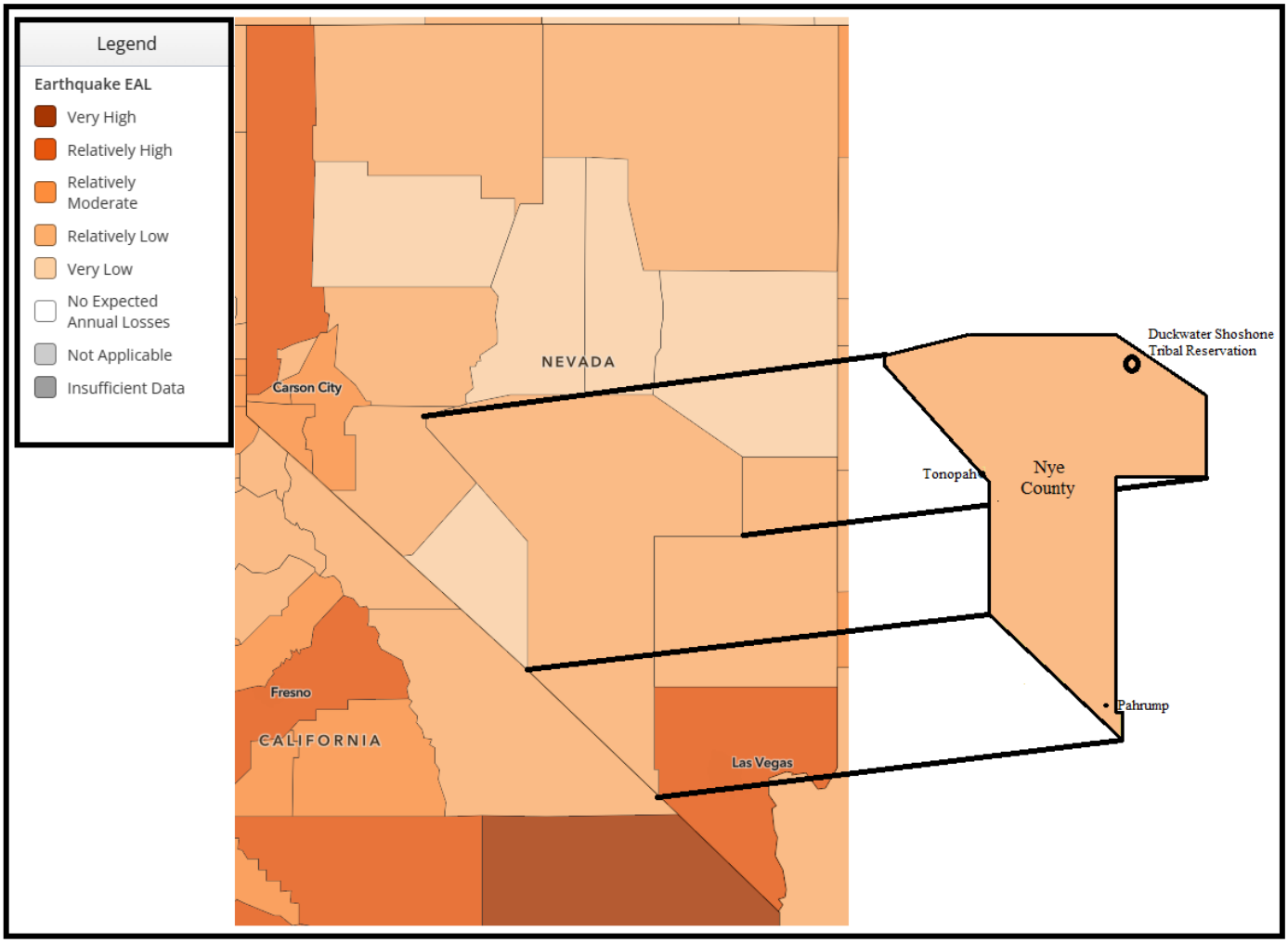
Map 31: FEMA NRI Earthquake Risk Index



Source: FEMA NRI

The following maps indicate the EAL for earthquakes for Nye County:

Map 32: FEMA NRI Earthquake EAL



Source: FEMA NRI

4.9.6 Potential Impact of Climate Change

Climate change will have minimal impact on earthquake occurrence.

4.9.7 Land Use and Development Trends

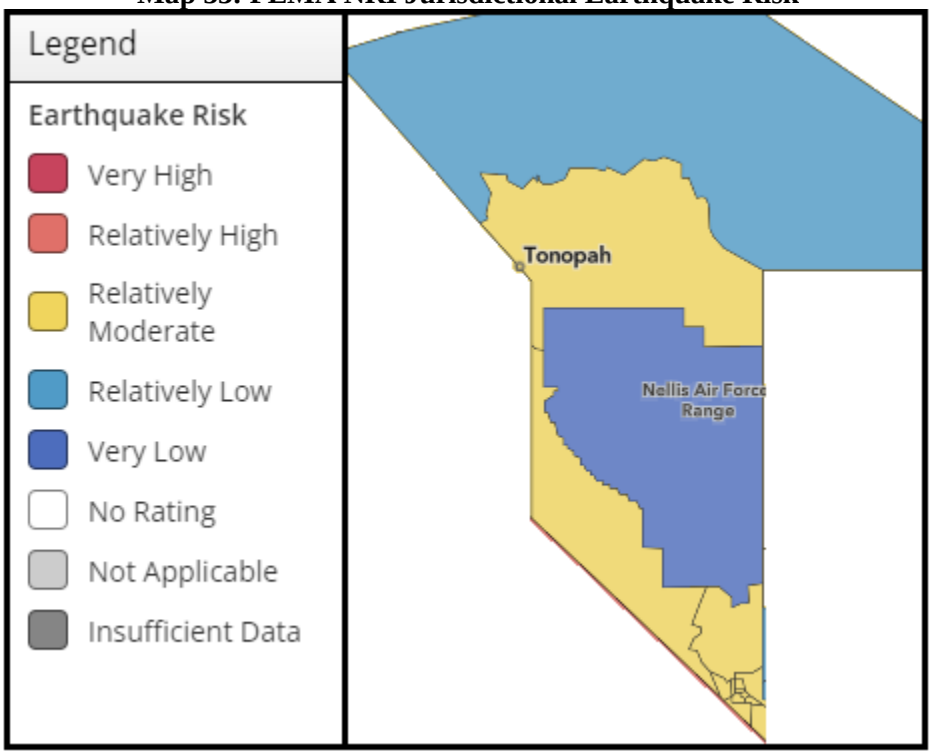
Future development speaks to the potential impacts of land use and demographic changes in hazard prone areas. Data in this section is speculative, as future conditions are subject to numerous unpredictable factors. While past trends are used to inform the discussion, previous historical trends are no guarantee of future conditions. However, as indicated in the data above, Nye County, all participating jurisdictions, and the Duckwater Shoshone Nation have been seeing generally static or declining populations and building stock. This static or declining population and building stock could decrease the impact to citizens from an earthquake through the reduction of demand on infrastructure systems.

4.9.8 Jurisdictional Risk and Vulnerability

To help understand the risk and vulnerability to earthquakes of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map was created indicating the potential risk to participating jurisdictions (as indicated by census tract) from earthquakes:

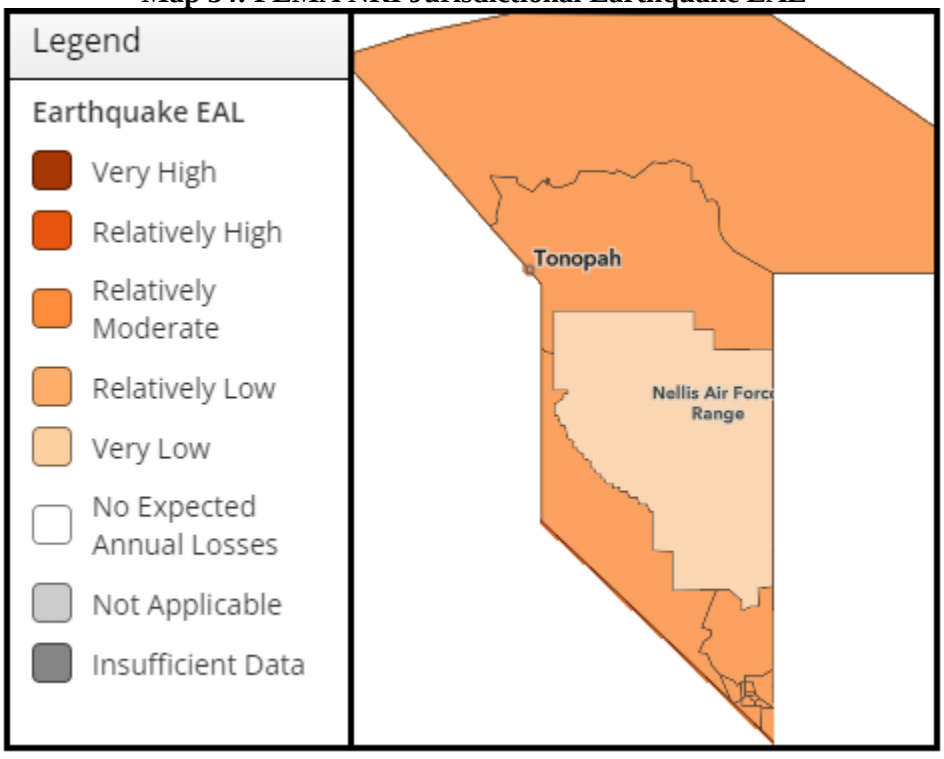
Map 33: FEMA NRI Jurisdictional Earthquake Risk



Source: FEMA NRI

As part of the NRI, EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk. The following map indicates the EAL for earthquakes for participating jurisdictions (as indicated by census tract) within Nye County:

Map 34: FEMA NRI Jurisdictional Earthquake EAL



The following table indicates the FEMA NRI and EAL analysis for each participating jurisdiction for earthquake:

Table 41: Nye County FEMA NRI for Earthquake by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Earthquake NRI	Relatively Low	Relatively Moderate	Relatively Low	Relatively Moderate	Relatively Moderate
Earthquake EAL	Relatively Low	Relatively Low	Relatively Low	Relatively Low	Relatively Low

Source: FEMA NRI

All jurisdictional citizens and structures are vulnerable to earthquake events. Using FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building valuation for each participating jurisdiction:

Table 42: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Population	Building Valuation
Amargosa Valley	480	$784,272,611
Duckwater Shoshone Tribe	219	$338,951,854
Pahrump	36,441	$7,423,893,881
Round Mountain	933	$338,951,854
Tonopah	2,179	$893,781,986

Source: FEMA NRI and U.S. Census Bureau

Potentially Vulnerable Community Lifelines

Earthquakes can impact various community lifelines, critical systems and services that communities rely on for their functioning. Vulnerabilities arise due to the stress that an earthquake places on infrastructure, resources, and operational processes. As an overview, the May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 43: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Electrical Service	$199
Loss of Wastewater Services	$66
Loss of Water Services	$138
Loss of Communications/Information Technology Services	$141

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

Earthquakes can have significant impacts on roads, leading to various issues and challenges. Earthquakes can cause the following impacts:

- Damage to Roads and Highways: Earthquakes can cause cracking, buckling, and even complete collapse of roads and highways, making them impassable. This can disrupt the flow of traffic and hinder rescue and recovery efforts.
- Bridge Failures: Bridges are particularly vulnerable to seismic activity due to their structural complexity. Earthquakes can cause bridge piers to shift or collapse, decks to crack, or even entire spans to fail, severing critical transportation routes.
- Railway Disruptions: Earthquakes can damage railway tracks, bridges, tunnels, and signaling systems, leading to disruptions in train services. This not only affects passenger travel but also impacts the transportation of goods and materials.

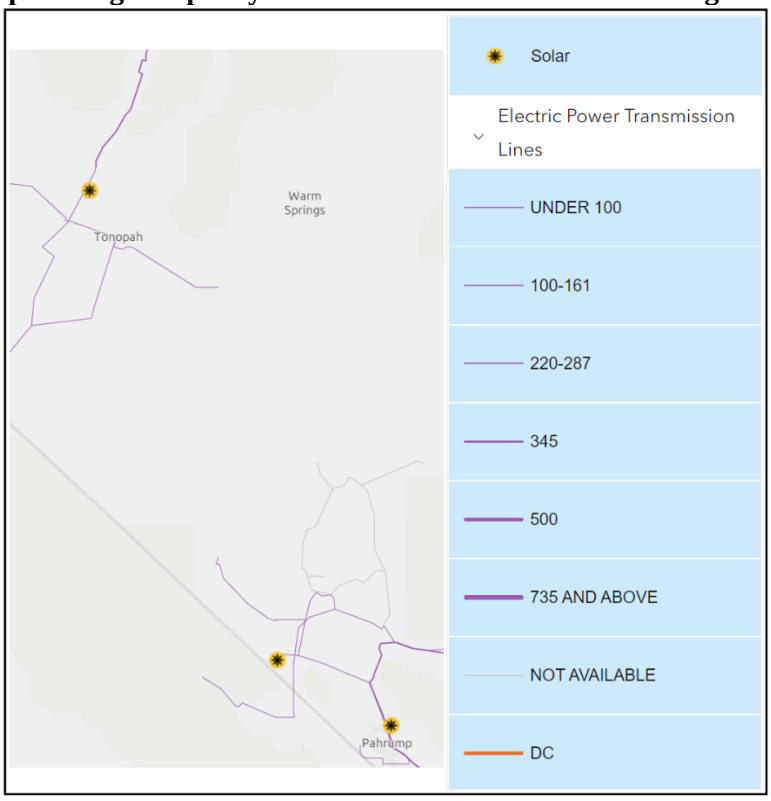
The cost to conduct maintenance on a road can vary significantly depending on the types of work required. However, the average estimate for repairs on a per mile basis in 2019 was $14,750 per mile. The cost to replace a road can vary significantly based on several factors, including the type of road, local labor and material costs, the complexity of the project, and the specific requirements of the replacement. As a rough estimate, road construction costs can range from $1,000,000 to $10,000,000 per mile.

Earthquakes can impact electrical utilities in various ways, potentially leading to disruptions in service. These impacts include:

- Damage to Power Plants: Seismic activity can damage power plants, particularly older facilities that may not be designed to withstand strong earthquakes. Damage to generators, turbines, cooling systems, and other critical components can lead to the shutdown of power generation facilities, reducing the supply of electricity.
- Transmission Line Failures: Earthquakes can cause transmission towers to collapse, conductors to break, and insulators to fail, disrupting the flow of electricity from power plants to substations and distribution networks. This can lead to widespread power outages over large geographic areas.
- Substation Damage: Substations, which serve as hubs for electricity distribution and voltage regulation, can suffer damage to transformers, switchgear, and other equipment during earthquakes. This can disrupt the distribution of electricity to homes, businesses, and other consumers.
- Damage to Distribution Networks: Earthquakes can damage distribution poles, transformers, and power lines, causing localized power outages in affected areas. Fallen power lines can also pose safety hazards and increase the risk of electrical fires.
- Secondary Effects: Power outages resulting from earthquakes can have cascading effects on critical services such as water supply, transportation, healthcare, and emergency response, further exacerbating the impact of the disaster on affected populations.

The following map details the location of electrical generation plants and high-capacity transmission lines in Nye County:

Map 35: High-Capacity Transmission Lines and Generating Plants

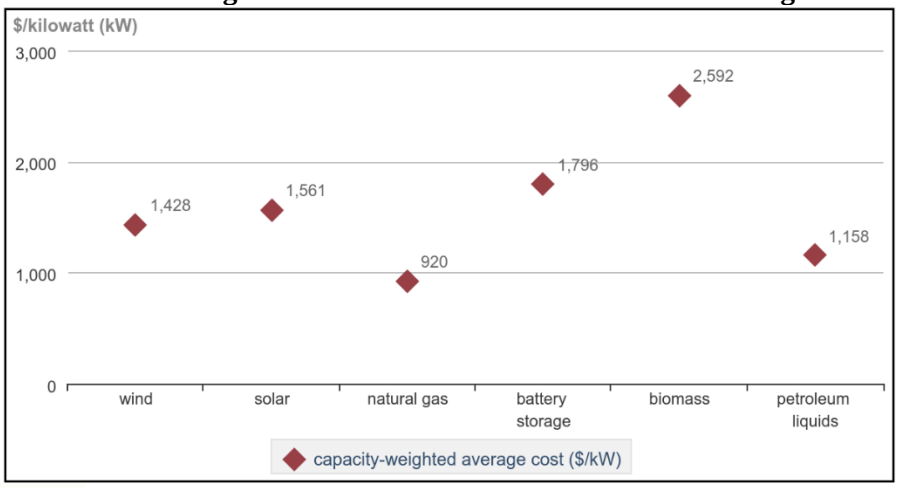


Source: National Energy Atlas

The cost to replace electrical lines can vary widely based on several factors, including the type of electrical lines, the distance of the replacement, local labor and material costs, the complexity of the project, and any specific requirements or challenges involved. Additionally, costs can be significantly different for residential, commercial, or industrial projects. Additionally, urban and rural locations may have varying cost factors. As a rough estimate, the cost to replace electrical lines can range from a few thousand dollars to several thousand dollars per mile.

Data concerning the construction costs of electrical generating plants from the U.S. Energy Information Administration indicates the following average per kW cost, by generating plant type, for new construction:

Chart 15: Average Construction Cost of Electrical Generating Plants



Source: U.S. Energy Information Administration

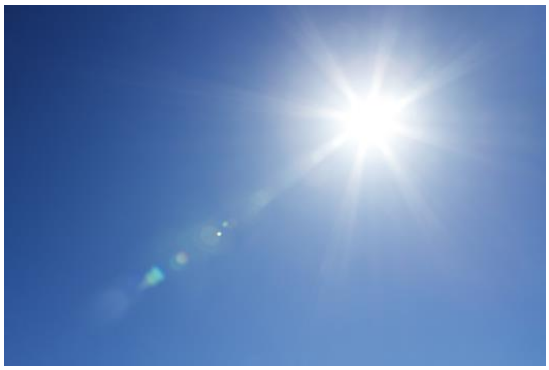
Hospitals and other smaller medical facilities may see an increase in severe injuries during a major earthquake events, and it is considered possible that this increase will impact or overload capacity. Nye County has one hospital, Desert View Regional Medical Center located at 360 South Lola Lane in Pahrump. Pahrump, NV. This facility has a total staffed bed capacity of 25.

Jurisdictions seeing either an increase in population or an increase in occupied housing units may be at increased risk to an earthquake. The following represent participating jurisdictions that have seen an increase in either of those parameters:

- Nye County: Increase in occupied housing units and increase in population (largely in Pahrump)
- Round Mountain: Increase in occupied housing units

All other participating jurisdictions (Amargosa Valley, Duckwater Shoshone Tribe, and Tonopah) have seen either a static state or decrease in both population and occupied housing units.

4.10 Extreme Heat



4.10.1 Hazard Description

Extreme heat events occur when climate conditions produce temperatures well outside of the predicted norm. These extremes can have severe impacts on human health and mortality, natural ecosystems, agriculture, and other economic sectors.

The Center for Disease Control identifies the following six groups as being especially vulnerable to extreme temperatures:

- Older Adults (aged 65)
- Infants and Children
- Individuals with Chronic Conditions
- Low-income Individuals
- Athletes
- Outdoor workers

4.10.2 Location & Extent

The temperatures of Nye County are largely influenced by its location in the Great Basin Desert, which is a large, arid region that covers much of the western United States. Nye County has a desert climate, characterized by hot, arid summers and cool, dry winters. Summers in Nye County are extremely hot, with temperatures regularly reaching well over 100°F (38°C) during the day. Winters are cooler, but still relatively mild compared to other parts of the United States, with daytime temperatures often hovering around 50-60°F (10-15°C).

All of Nye County is at risk to extreme heat, defined as:

- 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. Ambient air temperature is one component of heat conditions, with relative humidity being the other. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when an area of high atmospheric pressure traps moisture laden air near the ground.

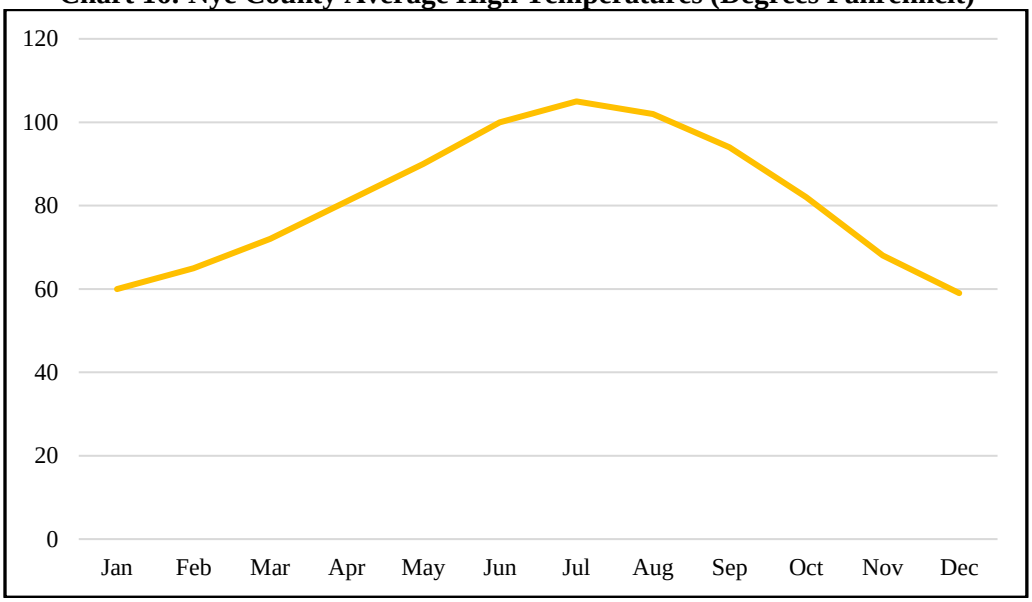
The following table and chart present average climate data for Nye County:

Table 44: Regional Average High Temperatures (Degrees Fahrenheit)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Maximum Temperature (F)	60	65	72	81	90	100	105	102	94	82	68	59

Source: NOAA

Chart 16: Nye County Average High Temperatures (Degrees Fahrenheit)



Source: NOAA

Data from NOAA indicates that Nye County experienced a record high temperature of 120°F (48.9°C) on June 29, 1994 in Beatty.

Extreme heat can occur anywhere in Nye County, including all jurisdictions and the entire Duckwater Shoshone Nation Tribal Reservation.

4.10.3 Previous Occurrences

The following table presents NCEI identified extreme heat temperature events and the resulting damage totals in Nye County from 2003 to 2022, with the years 2003 and 2022 being full dataset years, for the region. Data was reviewed regionally as the extreme heat events covered large areas.

Table 45: Nye County NCEI Excessive Heat Events, 2003 - 2022

Event Type	Number of Events	Property Damage	Deaths	Injuries
Excessive Heat	27	$0	0	0

Source: NOAA NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event oftentimes the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

This hazard is regional and widespread in nature, and occurrences for participating jurisdictions and the entire Duckwater Shoshone Nation Reservation are not unique from Nye County as a whole.

4.10.4 Probability of Future Events

Predicting the probability of extreme heat occurrences is tremendously challenging due to the large number of factors involved. Data from the NCEI indicates that Nye County can expect on a yearly basis, relevant to extreme heat events.

Table 46: Nye County Extreme Temperature Probability Summary

Data	Days
Number of Days with NCEI Reported Excessive Heat Event (2003-2022)	27
Average Events per Year	1 (1.35)

Source: NCEI

The probability of a future occurrence of this hazard is not unique to any participating jurisdiction, or the Duckwater Shoshone Nation Reservation, from Nye County as a whole.

4.10.5 Vulnerability and Impact

Extreme heat has the ability to impact the entire planning area, and all participating jurisdictions are at risk to potential impacts. Unfortunately, there is no accurate method of predicting the location or extent of extreme heat's impact or location. It is not possible to predict any varying probability between the participating jurisdictions with the exception of varying risk as it is proportionate to a participating jurisdiction's demographics. Logically, participating jurisdictions with a greater population are at a higher risk as participating jurisdictions with a lower population are at a lower risk.

Data from the NCEI indicates that Nye County can expect on a yearly basis, relevant to extreme temperature events:

Table 47: Nye County Extreme Temperature Impact Summary

Data	Recorded Impact
Deaths or Injuries (2003-2022)	0
Average Number of Deaths or Injuries	0

A primary concerns with this hazard are human health safety issues, as extreme heat can be a direct cause of death. Specific at-risk groups include outdoor workers, farmers, young children, and senior citizens. Compounding these concerns is the potential loss of electric power due to increased strain on power generation and distribution due to increased air conditioning needs. Additionally, lower income communities, or communities poorly served by power infrastructure may suffer disproportionate impacts.

The following table discusses potential impacts on human health related to excessive heat:

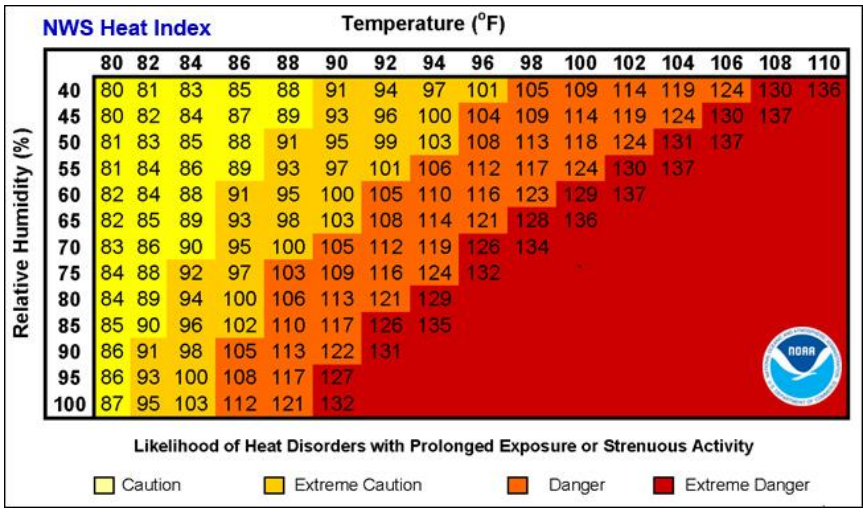
Table 48: Extreme Heat Impacts on Human Health

Temperature Range	Potential Impact on Human Health
80-90° F	Fatigue possible with prolonged exposure and/or physical activity
90-105° F	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program

Exposure to direct sun can increase Heat Index values by as much as 15°F. The zone above 105°F corresponds to a Heat Index that may cause increasingly severe heat disorders with continued exposure and/or physical activity. The following graph, from the NWS, indicates Heat Index values.

Chart 17: Heat Index



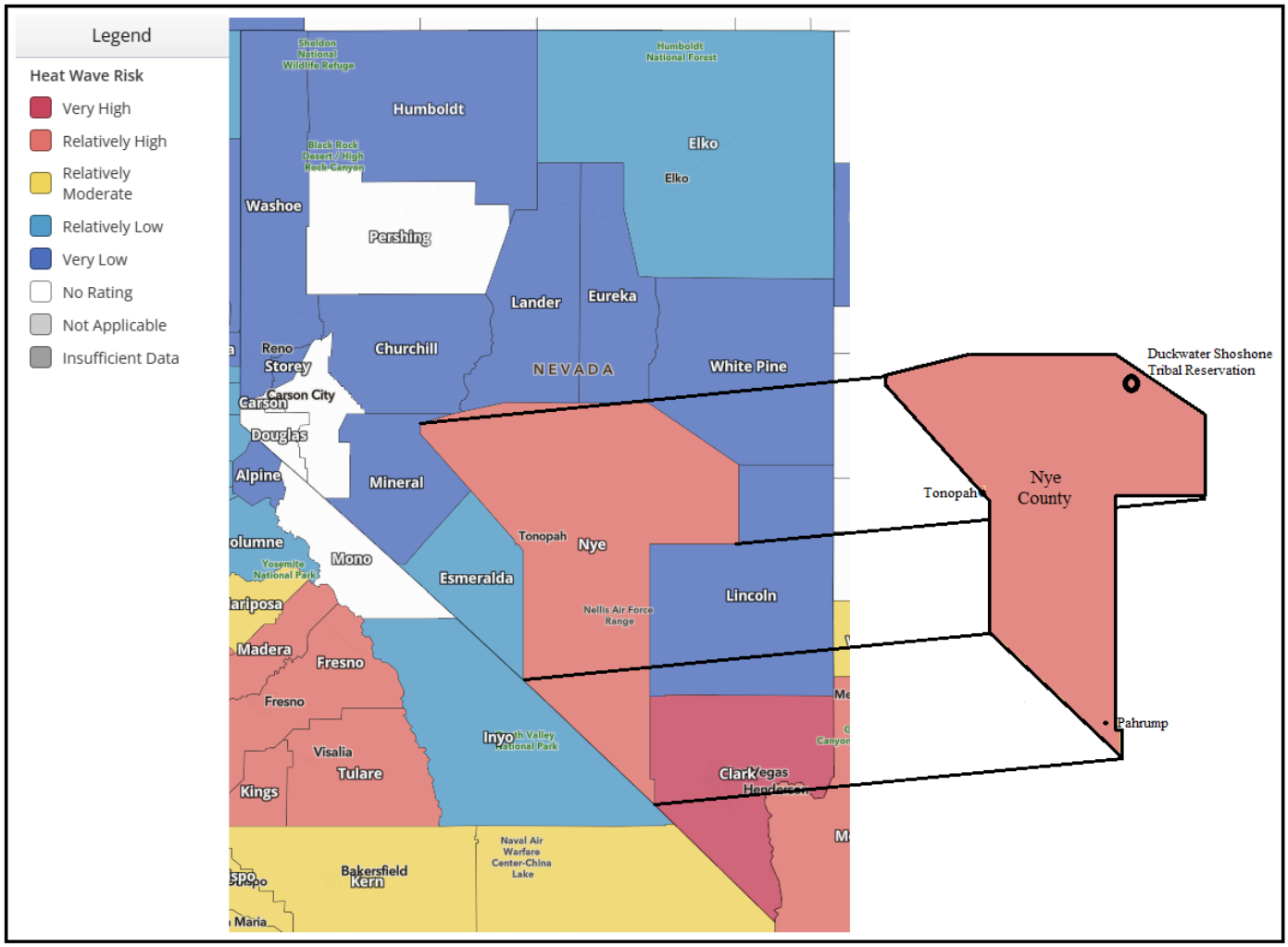
Source: National Weather Service

In general, critical facilities and infrastructure are not directly vulnerable to losses as a result of extreme heat. However, there is a potential that operations could be impacted by power failures caused by either increased utility demand or damaged power delivery infrastructure.

The impacts of future extreme heat events may have far reaching impacts. The incidence of wildfires increases substantially during extended periods of extreme heat, which in turn places both human and wildlife populations at higher levels of risk. Although environmental impacts are difficult to quantify, losses to plant and animal species, wildlife habitat, and air and water quality, wildfires, degradation of landscape quality, loss of biodiversity, and soil erosion may result from extended periods of extreme heat.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following maps were created indicating the potential risk to Nye County from heat waves:

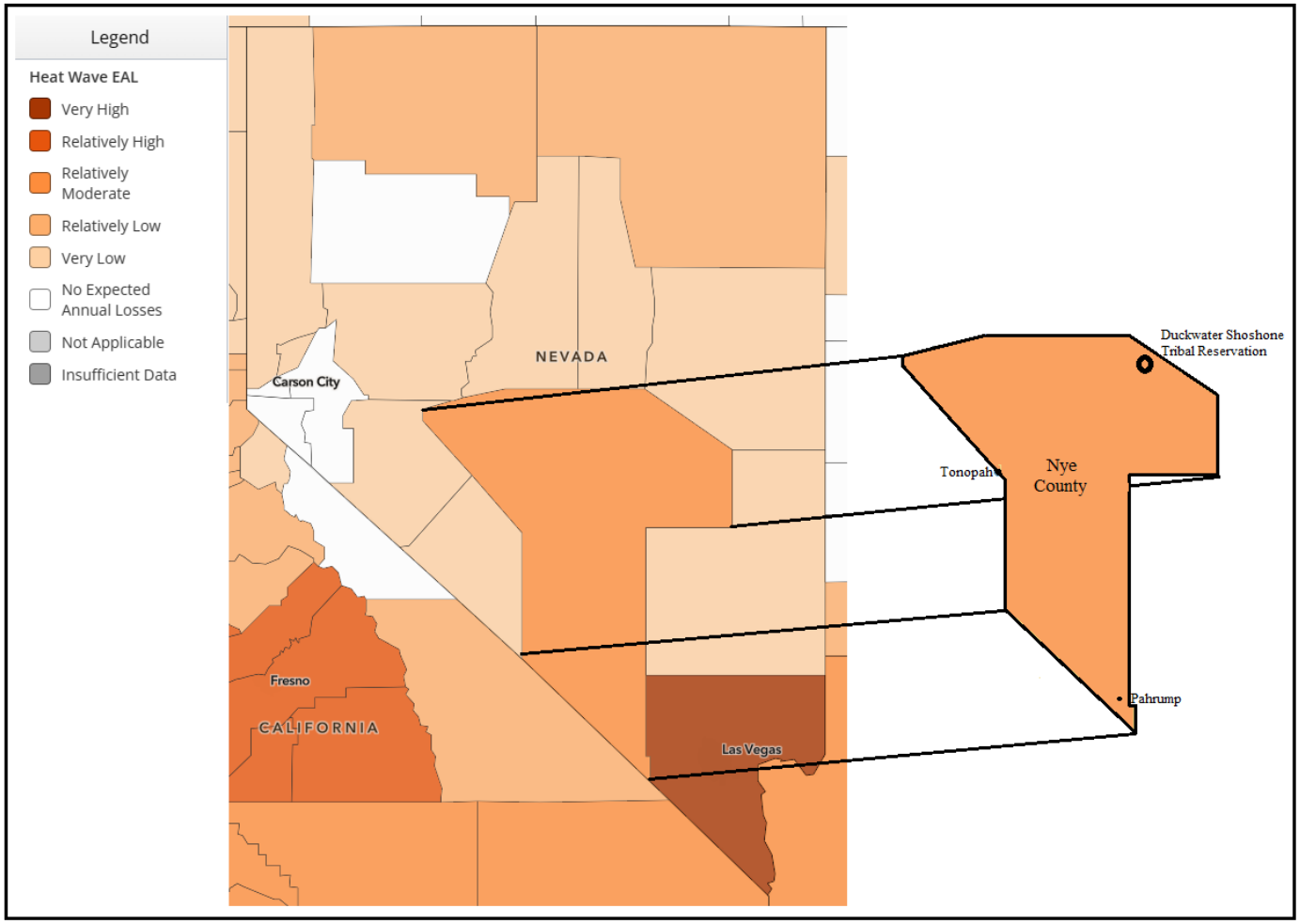
Map 36: FEMA NRI Heat Wave Risk Index



Source: FEMA NRI

The following maps indicate the EAL for heat waves for Nye County:

Map 37: FEMA NRI Heat Wave EAL



Source: FEMA NRI

4.10.6 Potential Impact of Climate Change

When discussing weather patterns, climate change should be considered as it may markedly change future weather-related events. Recent climate modeling results indicate that extreme temperature events may become more common for Nye County. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events including longer and hotter heat waves (and by correlation, an increased risk of wildfires, higher wind speeds, and tornado formation). Additionally, rising temperatures can harm air quality and amplify existing threats to human health. Warmer weather can increase the production of ground-level ozone, a pollutant that causes lung and heart problems. Heat stress is expected to increase as climate change brings hotter summer temperatures and more humidity. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor.

The Nevada State Climate Initiative fact sheet provides specific details about how climate change has already and will continue to impact the state of Nevada. It highlights historical trends and future projections for some major climate variables and how they may affect public health, water resources, the environment, hospitality, and agriculture. The following table details how climate change will most likely impact the citizens of Nye County in relation to extreme heat:

Table 49: Potential Impact of Climate Change, Heat Waves

Area of Impact	Historical Trends
Public Health	Increasing heat wave frequency and severity would increase the risk of illness, hospitalization and death. Heat waves have also been associated with more preterm births. Longer growing seasons could contribute to a longer allergy season.
Water Resources	Higher temperatures lead to increased evaporative demand, which reduces water levels. Higher temperatures and lower water levels can lead to poor water quality.
Environment	Warmer temperatures will make current habitats unsuitable for some plant and animal species. There could be negative impacts on wildlife, including higher mortality and even some local extinctions.
Recreation and Hospitality	Higher temperatures could make outdoor recreation less pleasant or safe and might deter summertime visits to Nevada.
Agriculture and Ranching	Increasing temperatures can negatively affect the health of farmers and ranchers. Heat also impacts livestock health and milk production. There could be negative impacts on plant health and crop production. Warmer temperatures and longer growing seasons provide opportunities to grow new crops but may also benefit invasive species and pests.

Source: Nevada Climate Initiative

4.10.7 Land Use and Development Trends

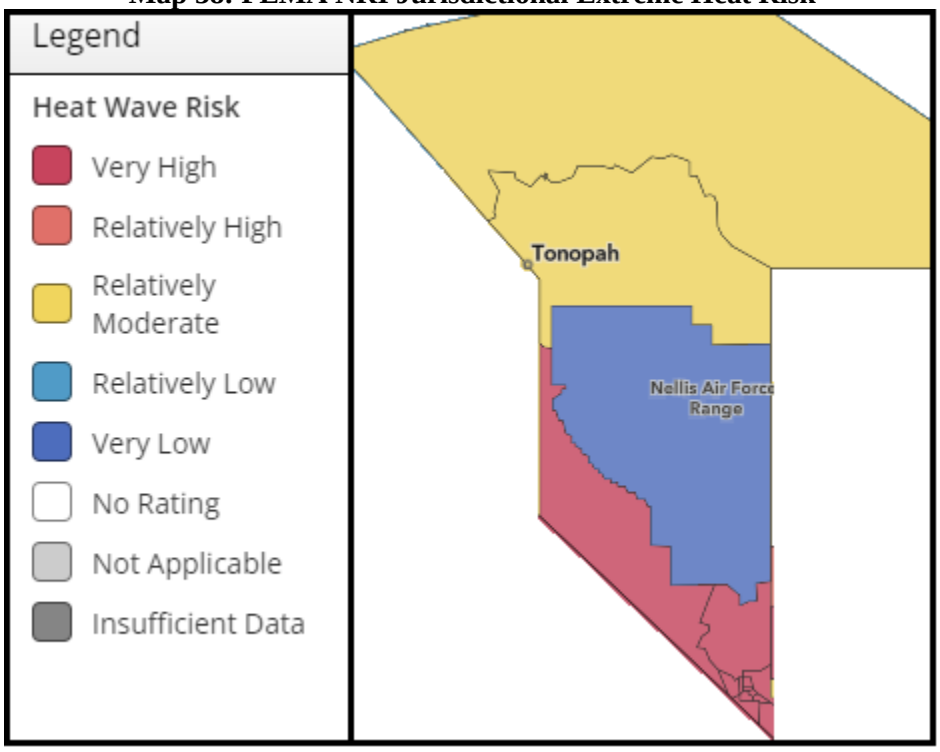
Future development speaks to the potential impacts of land use and demographic changes in hazard prone areas. Data in this section is speculative, as future conditions are subject to numerous unpredictable factors. While past trends are used to inform the discussion, previous historical trends are no guarantee of future conditions. However, as indicated in the data above, Nye County, all participating jurisdictions, and the Duckwater Shoshone Nation have been seeing generally static or declining populations. This static or declining population could decrease the impact to citizens from an earthquake through the reduction of demand on infrastructure systems.

4.10.8 Jurisdictional Risk and Vulnerability

To help understand the risk and vulnerability to extreme heat conditions of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map was created indicating the potential risk to participating jurisdictions (as indicated by census tract) from extreme heat:

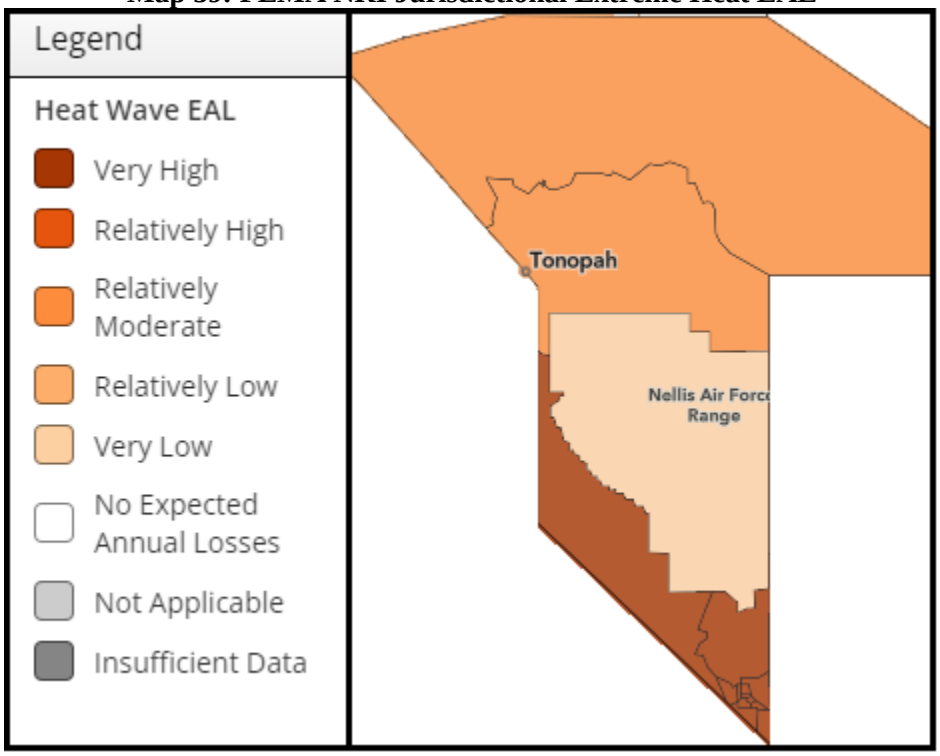
Map 38: FEMA NRI Jurisdictional Extreme Heat Risk



Source: FEMA NRI

As part of the NRI, EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk. The following map indicates the EAL for extreme heat for participating jurisdictions (as indicated by census tract) within Nye County:

Map 39: FEMA NRI Jurisdictional Extreme Heat EAL



Source: FEMA NRI

The following table indicates the FEMA NRI and EAL analysis for each participating jurisdiction for extreme heat:

Table 50: Nye County FEMA NRI and EAL for Extreme Heat by Jurisdiction

	Jurisdiction				
	Nye County	**Amargosa Valley**	**Duckwater Shoshone Nation**	**Round Mountain**	**Tonopah**
NRI	Relatively High	Very High	Relatively Moderate	Relatively Moderate	Relatively Moderate
EAL	Relatively High	Very High	Relatively Low	Relatively Low	Relatively Low

Source: FEMA NRI

All jurisdictional citizens and structures are vulnerable to extreme temperature events. Using FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building valuation for each participating jurisdiction:

Table 51: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Population	Building Valuation
Amargosa Valley	480	$784,272,611
Duckwater Shoshone Tribe	219	$338,951,854
Pahrump	36,441	$7,423,893,881
Round Mountain	933	$338,951,854
Tonopah	2,179	$893,781,986

Source: FEMA NRI and U.S. Census Bureau

Potentially Vulnerable Community Lifelines

Extreme temperatures can impact various community lifelines, critical systems and services that communities rely on for their functioning. Vulnerabilities arise due to the stress that extreme temperatures place on infrastructure, resources, and operational processes. As an overview, the May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 52: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Electrical Service	$199
Loss of Wastewater Services	$66
Loss of Water Services	$138
Loss of Communications/Information Technology Services	$141

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

Extreme temperatures, whether excessively hot or cold, can impact various community lifelines, critical systems and services that communities rely on for their functioning. Vulnerabilities arise due to the stress that extreme temperatures place on infrastructure, resources, and operational processes.

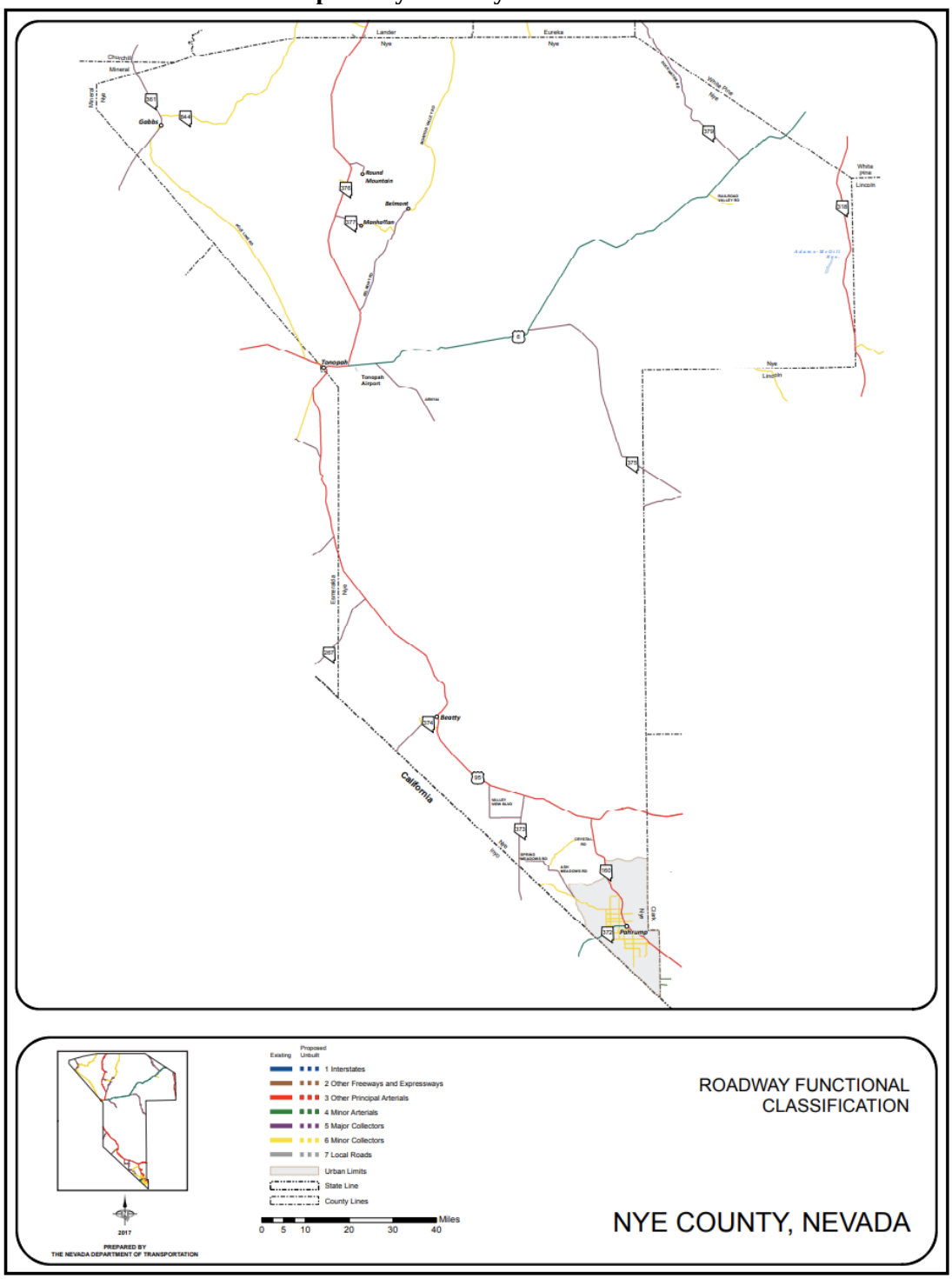
Extreme heat and extreme cold can have significant impacts on roads, leading to various issues and challenges. Extreme temperatures can cause the following impacts:

- Softening of Asphalt: High temperatures can cause asphalt to soften and become more susceptible to deformation. This leads to the development of ruts and potholes as the road surface loses its stability.
- Rutting and Raveling: The combination of high temperatures and heavy traffic loads can result in rutting, where depressions or grooves form in the road surface. Raveling, the disintegration of the asphalt surface, may also occur.
- Expansion and Contraction: Materials like concrete and asphalt expand in high temperatures and contract in cooler temperatures. This expansion and contraction can lead to cracking and deterioration of the road surface over time.

- Freeze-Thaw Cycles: Fluctuations between freezing and thawing can lead to the formation of ice within the road structure. The expansion of water as it freezes can result in cracks and damage to the road surface.
- Frost Heaving: During freeze-thaw cycles, moisture in the soil beneath the road can freeze, causing the ground to heave upward. This can result in uneven surfaces and damage to the road structure.

The following map, from the Nevada Department of Transportation, indicates roadways within Nye County:

Map 40: Nye County Road Network



Source: Nevada Department of Transportation

The cost to conduct maintenance on a road can vary significantly depending on the types of work required. However, the average estimate for repairs on a per mile basis in 2019 was $14,750 per mile. The cost to replace a road can vary significantly based on several factors, including the type of road, local labor and material costs, the complexity of the project, and the specific requirements of the replacement. As a rough estimate, road construction costs can range from $1,000,000 to $10,000,000 per mile.

Extreme heat and extreme cold can impact electrical utilities in various ways, potentially leading to disruptions in service. These impacts include:

- Power Outages: High temperatures can strain electrical systems, leading to increased demand for cooling systems like air conditioners. This heightened demand can overload power grids, resulting in power outages.
- Transformer Overheating: Transformers, which are crucial components in power distribution, can overheat in extreme temperatures. This can lead to malfunctions, reduced efficiency, or even failures, causing power disruptions.
- Equipment Failure: Electrical equipment, such as cables and switches, may experience higher resistance and increased stress during extreme heat, increasing the likelihood of equipment failures.
- Reduced Efficiency in Power Plants: Power generation facilities may experience reduced efficiency during heatwaves due to elevated ambient temperatures. This can affect the output and lead to shortages.
- Icing on Power Lines: Ice accumulation on power lines can lead to increased weight, potentially causing lines to sag or break. This can result in power outages and safety hazards.
- Communication Disruptions: Both extreme heat and cold can impact communication infrastructure. For example, extreme cold can affect the performance of fiber optic cables, while extreme heat can lead to equipment failures in communication systems.

Mapping concerning high-capacity transmission lines and electrical generating locations is provided in Section 4.9.8.

Hospitals and other smaller medical facilities may see an increase in heat or cold related illness during an extreme temperature event, but it is considered unlikely that this increase will impact or overload capacity. However, extreme temperatures can increase the demand for emergency shelters, particularly in cases of widespread power outages. Setting up and managing these shelters can strain resources.

At greater risk may be the vulnerable populations of each participating jurisdiction, including the especially young, the elderly, and those below the poverty level. Hazard occurrences can exacerbate existing vulnerabilities and create new challenges. Vulnerable populations may have pre-existing health conditions that make them more susceptible to heat-related illnesses and dehydration. Limited mobility or access to medical care can also increase their vulnerability. Persons on fixed incomes and with limited resources may face difficulties in cooling their homes.

The following table details potentially vulnerable populations by participating jurisdictions:

Table 53: Nye County Potential at Risk Population Data

	Population 5 and Under (2020)	Population Over 65 (2020)	Speak a Language Other Than English (2020)	Estimated People in Poverty (2020)
Nye County	858 (1.7%)	7,515 (14.6%)	6,243 (12.1%)	8,048 (15.6%)
Amargosa Valley	115 (10.8%)	257 (24.2%)	455 (42.8%)	586 (55.1%)
Pahrump	1,906 (4.3%)	13,405 (30.0%)	5,100 (11.4%)	6,442 (14.4%)
Round Mountain	160 (17.1%)	126 (13.5%)	79 (8.5%)	108 (11.6%)
Tonopah	18 (0.8%)	745 (34.2%)	190 (8.7%)	418 (19.2%)
Duckwater Shoshone	30 (13.7%)	50 (22.8%)	60 (27.5%(	75 (34.2%)

Source: United States Census Bureau 2020

4.11 Flood

4.11.1 Hazard Description

Flooding, as defined by the National Weather Service (NWS), is the rising and overflowing of a body of water onto normally dry land. It can result from any overflow of inland or tidal waters, or an unusual accumulation or runoff of surface waters from any source. Flooding is loosely classified as inland, riverine, or coastal.

Inland flooding, also known as "urban flooding" or "flash flooding," can be caused by intense, short-term rain or by moderate rainfall over several days, which can overwhelm existing drainage infrastructure. Other factors that affect the dynamics of this type of flood include slope, width, and vegetation in place along the watercourse banks. The slope that a flash flood traverses has a definite relationship to the overall speed in which the water will travel. The incline on which the water moves affects the width of the flooding area. Generally, the faster the water moves, the narrower that channel will be created, since the water digs the channel deeper as it flows. When water flows over shallower slope, it tends to spread out more, decreasing its potential to cause mass damage but still considered dangerous. Finally, the type of vegetation located along the flood's path can prevent further erosion of the channel banks. A structure that lies along a flood channel with no surrounding vegetation is at risk of having its foundation undercut, which can cause structural damage, or in some cases, a building's complete collapse. Riverine or alluvial, flooding occurs when excessive rainfall over an extended period of time causes a river to exceed its capacity. Typical causes of flooding, both inland and riverine, include tropical cyclonic systems, frontal systems, and isolated thunderstorms combined with other environmental variables such as changes to the physical environment, topography, ground saturation, soil types, basin size, drainage patterns, and vegetative cover. The rate of onset and duration of flooding events depends on the type of flooding (typical flood or flash flood). The spatial extent of a flooding event depends on the amount of water overflow but can usually be mapped because of existing floodplains.

A floodplain is a flat or nearly flat land adjacent to a river or stream that experiences occasional or periodic flooding environment, topography, ground saturation, soil types, Floodplains, or Special Flood Hazard Areas (SFHAs), are made when floodwaters exceed the capacity of the main channel or escape the channel by eroding its banks. The sediments (rock and debris) that build up over time from the floodplain's floor. Floodplains also include a floodway, which consists of the water channel and adjacent areas that carry flood flows and the flood fringe, which are areas covered by the flood but do not experience a strong current.

In its common usage, floodplains refer to areas inundated by the 100-year flood, i.e., the flood that has a 1% chance of being equaled or exceeded in any given year and the 500-year flood, i.e., the flood that has a 0.2% chance of being equaled or exceeded in any given year. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP). The NFIP aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners, renters, and businesses and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of general risk insurance and flood insurance.

According to the FEMA, water, and flooding account for about 40% of the Presidential declared disasters in the United States.

4.11.2 Location and Extent

A variety of factors affect the severity of flash and riverine flooding within the planning area. These include topography, weather characteristics, development, and geology.

Flash flooding is unpredictable and can occur anywhere throughout the entire planning area. Nye County and its participating jurisdictions do not have any centralized, or identified reoccurring, locations that are more likely to experience flash flooding than other areas, based on previous events and historical documentation. The reviewed historical documentation repeatedly mentions roads and ditches being flooded, but no specific areas continually experiencing flash flooding. Additionally, when property damage occurred, none of the locations were repeatedly mentioned. Historically, Nye County and its participating jurisdictions have seen sporadic, severe flash floods. All participating jurisdictions are exposed to flash floods.

The following table details FEMA's flood zone classifications:

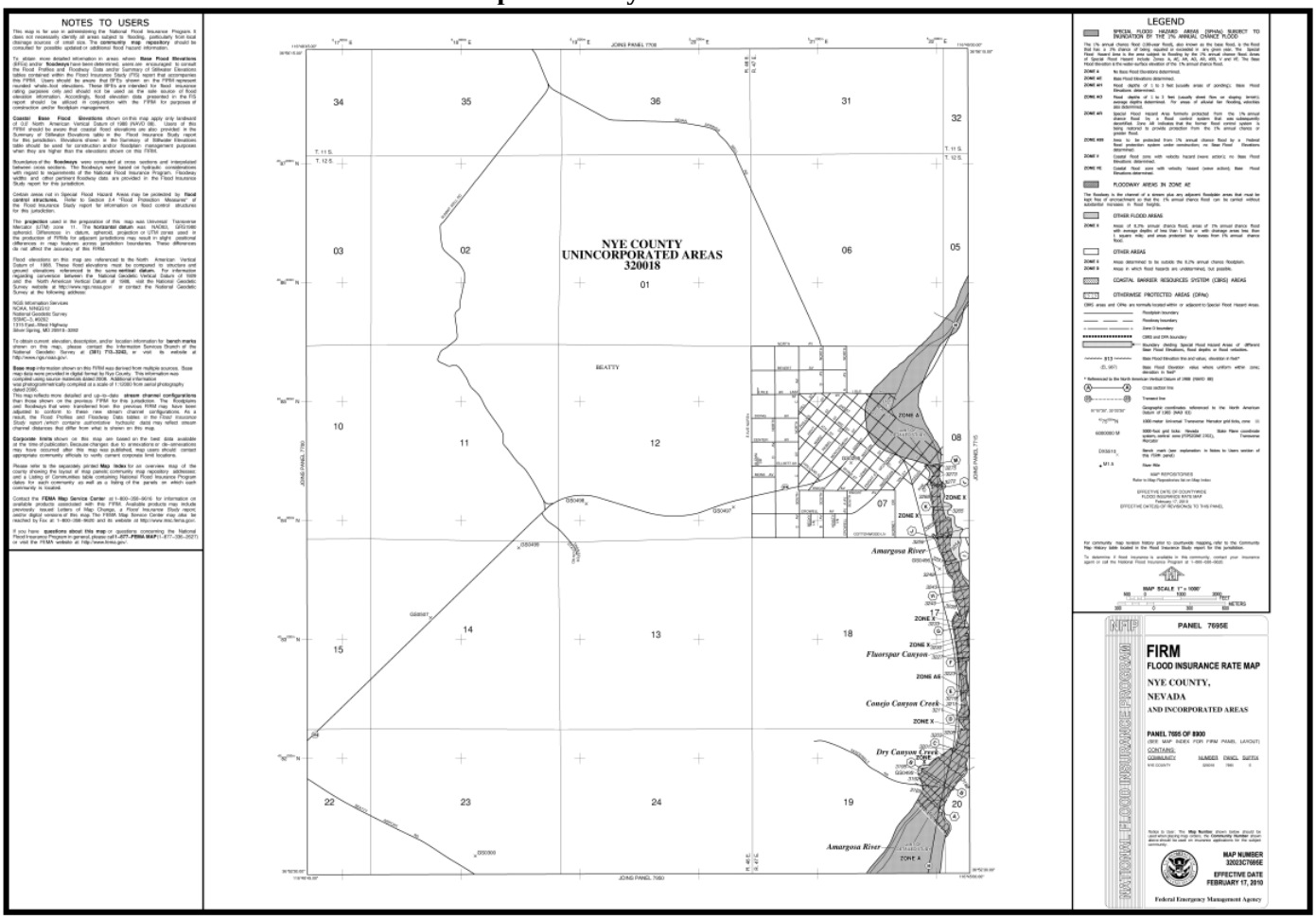
Table 54: Flood Zone Classifications

Zone	Description
A	An area inundated by 1% annual chance flooding, for which no BFEs have been determined. (100-Year Floodplain)
AE	An area inundated by 1% annual chance flooding, for which BFEs have been determined. (100-Year Floodplain)
Shaded X	Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. An area inundated by 0.2% annual chance flooding.
Unshaded X	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100- year flood.

Source: FEMA

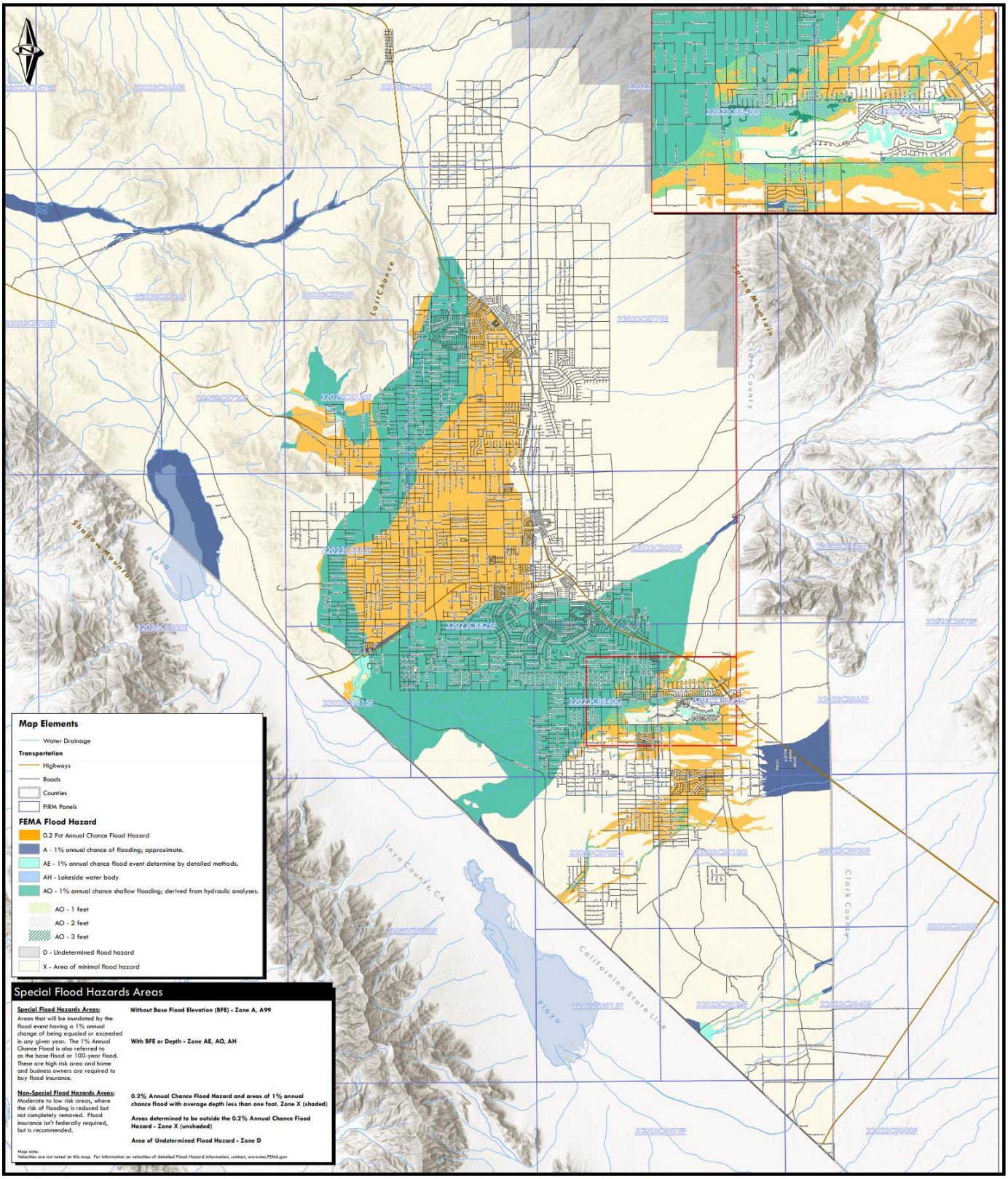
The following maps, compiled using available FEMA data, identify potential flood areas of the county. Please note that not all areas of the county are currently mapped. Additionally, FIRM panels from unincorporated, lightly populated areas of the county are not included in this plan, but are available through the Nye County Planning Department and Floodplain Administration

Map 41: Beatty Area Flood Zones



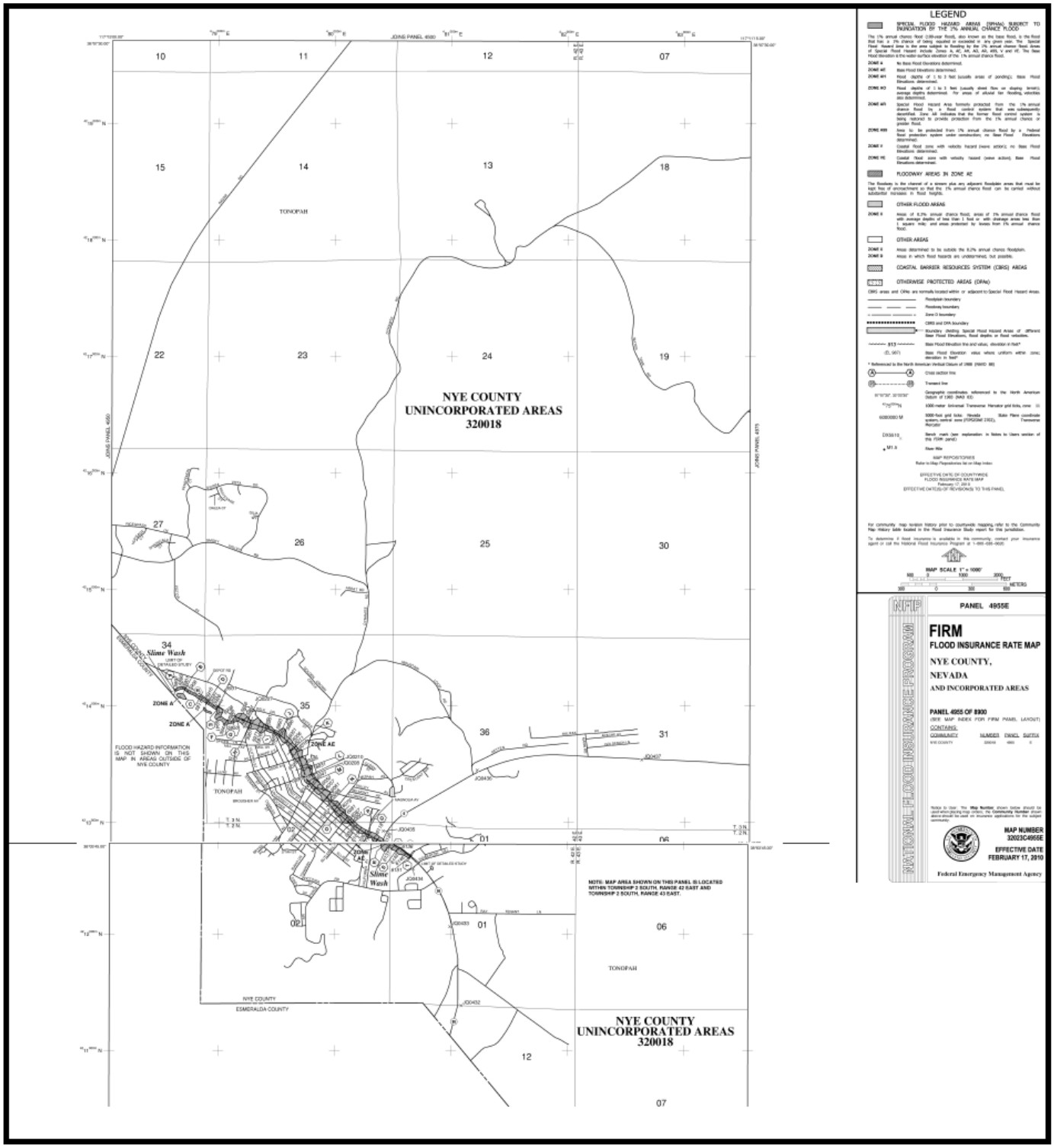
Source: FEMA

Map 42: Pahrump 100 Year Floodplain Map



Source: Nye County

Map 43: Tonopah Area Flood Zones



Source: FEMA

Flooding, and especially flash flooding, can occur anywhere in Nye County, including all jurisdictions and the entire Duckwater Shoshone Nation Tribal Reservation.

4.11.3 Previous Occurrences

The following table presents NCEI identified flood events and the resulting damage totals in Nye County from 2003 to 2022, with the years 2003 and 2022 being full dataset years:

Table 55: Nye County NCEI Flood and Flash Flood Events, 2003-2022

Jurisdiction	Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
Nye County (total)	Flood	3	$0	0	0
	Flash Flood	39	$1,294,000	0	0

Source: NCEI

As a subset of the above information, the following table presents NCEI identified flood events and the resulting damage totals in participating jurisdictions from 2003 to 2022, with the years 2003 and 2022 being full dataset years. Please note that the major flood event of 2018 impacted a large portion of the county, and as such damage data is not specific to jurisdictions.

Table 56: Jurisdictional NCEI Flood and Flash Flood Events, 2003-2022

Jurisdiction	Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
Beatty	Flood	0	$0	0	0
	Flash Flood	4	$10,000	0	0
Pahrump	Flood	1	$0	0	0
	Flash Flood	15	$1,129,000	0	0
Tonopah	Flood	1	$0	0	0
	Flash Flood	7	$14,000	0	0

Source: NCEI

The following provides both local accounts and NCEI descriptions of notable recorded events:

- **August 6, 2022, Duckwater**: Multiple locations reported a combination of brief heavy rain, flooding, or debris flows. No deaths, injuries, or property damage were reported.
- **July 26, 2021, Pahrump:** This is a continuation of the July 17-21 Thunderstorms episode, which lasted ten days total. Several roads were closed due to flooding, and approximately 20 swift water rescues occurred. Damages were reported at $50,000.
- **July 19, 2021, Tonopah**: Law enforcement reported minor flooding at the corner of Main Street and Cutting. An estimated 2-3 inches of water was seen flowing over the roadway. It was estimated that the flooding lasted 30 minutes. No deaths, injuries, or property damage were reported.
- **October 18, 2015, Nye County:** A series of storms caused flash flooding events throughout the county. Cumulative damage was reported at $87,000.
- **December 22, 2010, Pahrump:** A series of storms fueled by a tropical moisture tap pounded the Mojave Desert and southern Great Basin for several days. Extremely heavy snow and widespread flooding resulted. Numerous roads were flooded. There was significant damage to one road and portions of the sewer system. Damages were reported at $750,000.
- **September 2, 2003, Pahrump:** Runoff from a thunderstorm east of Pahrump caused Highway 160 to become submerged under 3 feet of water. Several drivers had to be rescued after attempting to drive through the water. No deaths, injuries, or property damage were reported.

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event oftentimes the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be

underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

4.11.4 Probability of Future Incidents

The definition of each flood zone's classification is used for the purpose of calculating the yearly probability of a riverine flood. Jurisdictions with property in a 100-year floodplain can expect a 1% annual chance of flooding within the designated areas. Jurisdictions with property in a 500-year floodplain can expect a 0.2% annual chance of flooding within the designated areas.

Further, data from the NCEI indicates that Nye County can expect on a yearly basis, relevant to riverine flood events:

Table 57: Riverine Flood Probability Summary

Jurisdiction	Data	Events
Nye County	Number of Days with NCEI Reported Event (2003-2022)	3
	Average Events per Year	<1
Beatty	Number of Days with NCEI Reported Event (2003-2022)	0
	Average Events per Year	0
Duckwater Shoshone Tribal Reservation	Number of Days with NCEI Reported Event (2003-2022)	0
	Average Events per Year	0
Pahrump	Number of Days with NCEI Reported Event (2003-2022)	1
	Average Events per Year	<1
Tonopah	Number of Days with NCEI Reported Event (2003-2022)	1
	Average Events per Year	<1

Source: NCEI

Data from the NCEI indicates that Nye County and participating jurisdictions can expect on a yearly basis, relevant to flash flood events:

Table 58: Flash Flood Probability Summary

Jurisdiction	Data	Events
Nye County	Number of Days with NCEI Reported Event (2003-2022)	39
	Average Events per Year	2
Beatty	Number of Days with NCEI Reported Event (2003-2022)	4
	Average Events per Year	<1
Duckwater Shoshone Tribal Reservation	Number of Days with NCEI Reported Event (2003-2022)	0
	Average Events per Year	0
Pahrump	Number of Days with NCEI Reported Event (2003-2022)	15
	Average Events per Year	1
Tonopah	Number of Days with NCEI Reported Event (2003-2022)	7
	Average Events per Year	<1

Source: NCEI

4.11.5 Vulnerability and Impact

Data from the NCEI indicates that Nye County and participating jurisdictions can expect on a yearly basis, relevant to riverine flood events:

Table 59: Riverine Flood Impact Summary

Jurisdiction	Data	Recorded Impact
Nye County	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0

Table 59: Riverine Flood Impact Summary

Jurisdiction	Data	Recorded Impact
	Total Reported NCEI Property Damage (2003-2022)	$0
	Average Property Damage per Year	$0
Beatty	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$0
	Average Property Damage per Year	$0
Duckwater Shoshone Tribal Reservation	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$0
	Average Property Damage per Year	$0
Pahrump	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$0
	Average Property Damage per Year	$0
Tonopah	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$0
	Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Nye County and participating jurisdictions can expect on a yearly basis, relevant to flash flood events:

Table 60: Flash Flood Impact Summary

Jurisdiction	Data	Recorded Impact
Nye County	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$1,294,000
	Average Property Damage per Year	$64,700
Beatty	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$10,000
	Average Property Damage per Year	$500
Duckwater Shoshone Tribal Reservation	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$0
	Average Property Damage per Year	$0
Pahrump	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$1,650,000
	Average Property Damage per Year	$56,450
Tonopah	Deaths or Injuries (2003-2022)	0
	Average Number of Deaths or Injuries	0
	Total Reported NCEI Property Damage (2003-2022)	$14,000
	Average Property Damage per Year	$700

Source: NCEI

The adverse impacts of flooding can include structural damage; agricultural crop loss; the death of livestock; loss of access to critical facilities due to roads being washed out or overtopped; unsanitary conditions resulting from materials

such as dirt, oil, solvents, and chemicals being deposited during the recession; infestations of disease-carrying mosquitoes; mold and mildew, which pose a severe health risk to small children and the elderly; and temporary backwater effects in sewers and drainage systems. Raw sewage is a breeding ground for bacteria, such as E.coli and other disease-causing agents. A boil order may need to be issued to protect people and animals from contaminated water.

Of equal concern is the long-term psychological effect that flooding has on the people impacted by it. They must contend with the loss of life, property, livelihood, etc., as they cope with the aftermath. The clean-up can take months. The cost to restore a home may be too much, especially for the unprepared or uninsured. Plus, there is the looming fear that it may flood again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

The results of the HAZUS analysis were utilized to estimate potential losses for riverine flooding. The intent of this analysis was to enable Nye County to estimate where flood losses could occur and the degree of severity using a consistent methodology. The HAZUS model helps quantify risk along known flood-hazard corridors as well as lesser streams and rivers that have a drainage area of 10 square miles or more. HAZUS®, version 5.0, was used to perform the analysis using essential facility data available through HAZUS databases and HIFLD data. The analysis was completed by BOLDplanning. For this hazard, the risk assessment data and maps involved were from an analysis of 1% annual chance flood event (100-Year Flood). The reported losses are based upon essential facility and census data as part of HAZUS.

HAZUS determines the displaced population based on the inundation area, not necessarily impacted buildings. As a result, there may be a population vulnerable to displacement even if the structure is not vulnerable to damage. Individuals and households will be displaced from their homes even when the home has suffered little or no damage either because they were evacuated or there was no physical access to the property because of flooded roadways.

Flood sheltering needs are based on the displaced population, not the damage level of the structure. HAZUS determines the number of individuals likely to use government-provided short-term shelters through determining the number of displaced households as a result of the flooding. To determine how many of those households and the corresponding number of individuals will seek shelter in government-provided shelters, the number is modified by factors accounting for income and age. Displaced people using shelters will most likely be individuals with lower incomes and those who do not have family or friends within the immediate area. Since the income and age factors are taken into account, the proportion of displaced population and those seeking shelter will vary from county to county.

Additionally, HAZUS takes into account flood depth when modeling damage (based on FEMA's depth-damage functions). Generated reports capture damage by occupancy class (in terms of square footage impacted) by damage percent classes. Occupancy classes include agriculture, commercial, education, government, industrial, religion, and residential. Damage percent classes are grouped by 10 percent increments up to 50%. Buildings that sustain more than 50% damage are considered to be substantially damaged.

Multiple attempts were made to run a HAZUS report for all of Nye County, resulting in failure for each attempt. As such, HAZUS reports were completed on four sections of the county, representing the northeast, northwest, southeast, and southwest. It is worth noting that this overlapping reporting may result in minor duplications and potential overreporting.

The following table provides the HAZUS results for vulnerable populations and the population estimated to seek short term shelter as well as the numbers of damaged and substantially damaged buildings for Nye County:

Table 61: Nye County HAZUS Flood Scenario Displaced Population Building Damages

Region	Displaced Population	Person Seeking Shelter	Damaged Buildings	Destroyed Buildings
Nye County Northwest	8	0	0	0

Table 61: Nye County HAZUS Flood Scenario Displaced Population Building Damages

Region	Displaced Population	Person Seeking Shelter	Damaged Buildings	Destroyed Buildings
Nye County Northeast	5	0	0	0
Nye County Southwest	163	3	15	1
Nye County Southeast	8,699	782	1,816	895

Source: FEMA HAZUS

The HAZUS analysis also provides an estimate of the repair costs for impacted buildings as well as the associated loss of building contents and business inventory. Building damage can also cause additional losses to a community by restricting a building's ability to function properly. Income loss data accounts for losses such as business interruption and rental income losses as well as the resources associated with damage repair and job and housing losses. These losses are calculated by HAZUS using a methodology based on the building damage estimates.

The damaged building counts generated by HAZUS are susceptible to rounding errors and are likely the weakest output of the model due to the use of census blocks for analysis. Generated reports include this disclaimer: "Unlike the earthquake and hurricane models, the flood model performs its analysis at the census block level. This means that the analysis starts with a small number of buildings within each census block and applies a series of distributions necessary for analyzing the potential damage. The application of these distributions and the small number of buildings make the flood model more sensitive to rounding errors that introduces uncertainty into the building count results." Additionally, losses are not calculated for individual buildings, but instead are based on the performances of entire classes of buildings obtained from the general building stock data. In the flood model, the number of grid cells (pixels) at each flood depth value is divided by the total number of grid cells in the census block. The result is used to weight the flood depths applied to each specific occupancy type in the general building stock. First floor heights are then applied to determine the damage depths to analyze damages and losses.

The following table provides the HAZUS results for building damages and business interruption loss due to these damages:

Table 62: Nye County HAZUS Flood Scenario Structural Damage and Income Loss

Region	Building Loss	Total Business Interruption Loss
Nye County Northwest	$910,000	$1,430,000
Nye County Northeast	$260,000	$370,000
Nye County Southwest	$6,810,000	$5,390,000
Nye County Southeast	$404,540,000	$226,920,000

Source: FEMA HAZUS

The HAZUS model also indicated that the following number of critical facilities are estimated to be damaged or suffer loss of use from the flood scenario.

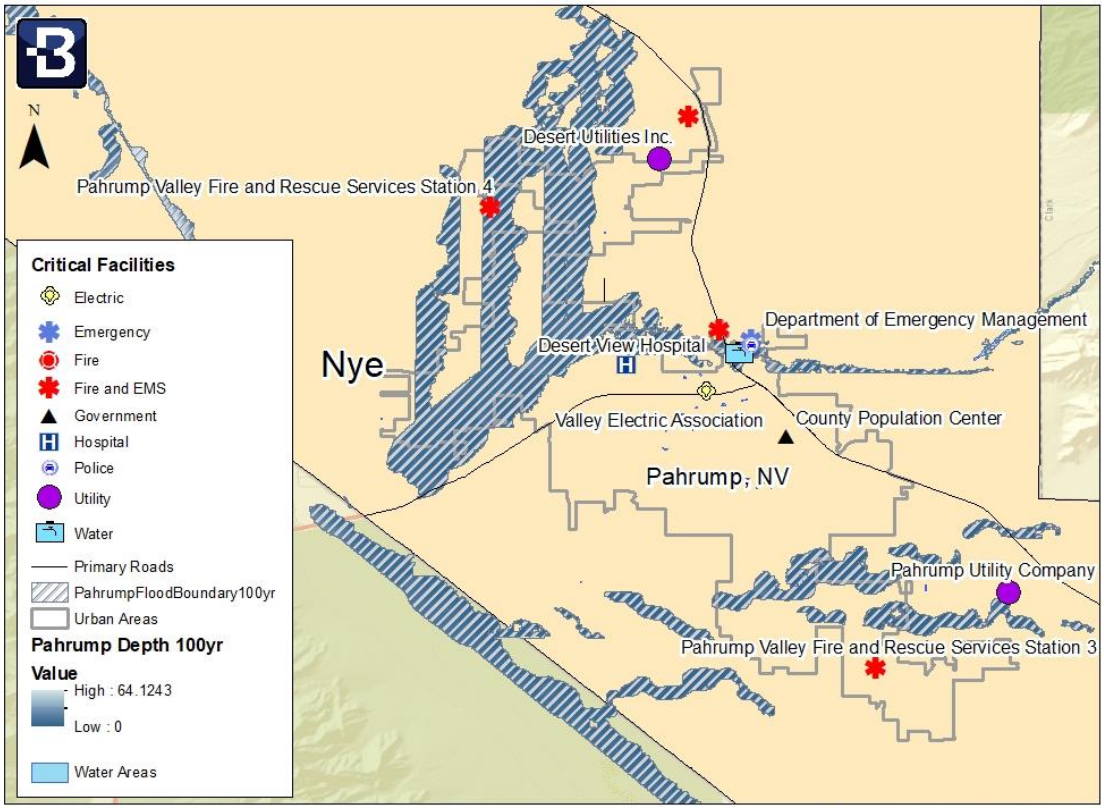
Table 63: HAZUS Flood Scenario Number of Critical Facilities Damaged or Impacted

Region	Fire Stations	Hospitals	Police Stations	Schools
Nye County Northwest	0	0	0	0
Nye County Northeast	0	0	0	0
Nye County Southwest	0	0	0	0
Nye County Southeast	0	0	0	0

Source: FEMA HAZUS

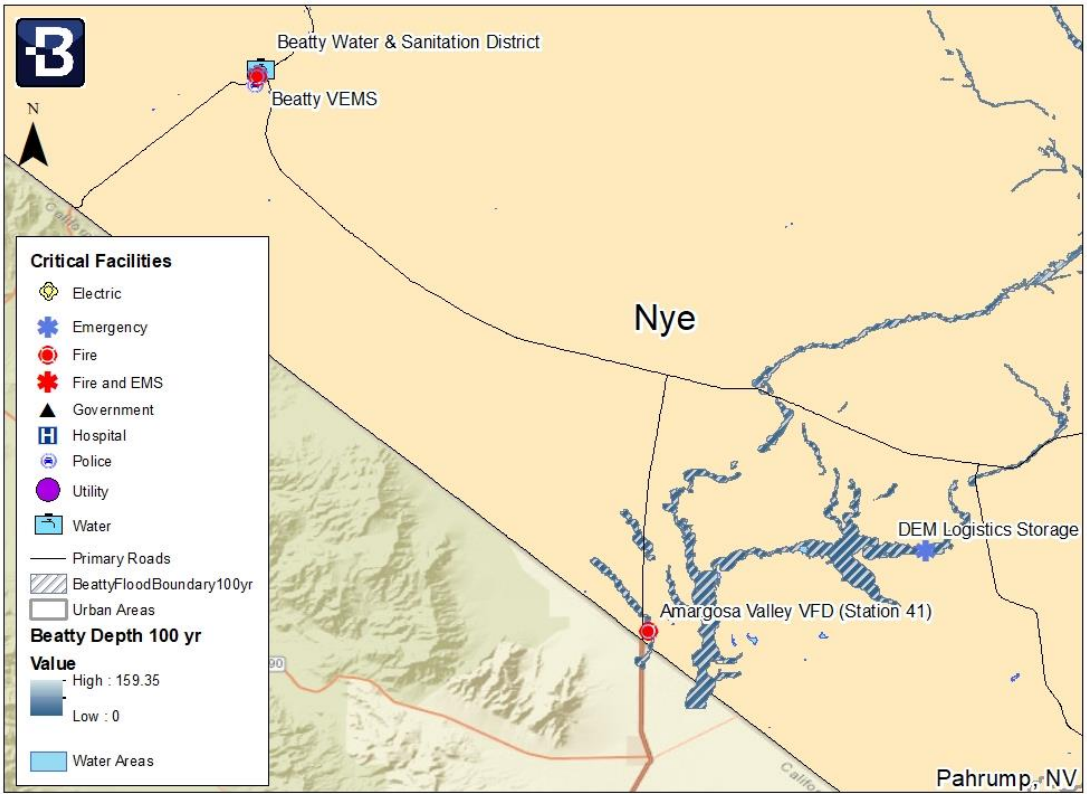
Mapping was also completed to detail essential facilities (provided by NCOEM and participating jurisdictions) in relation to the flooded areas from HAZUS Level One modeling efforts.:

Map 44: Critical Facilities in Potential Flood Areas



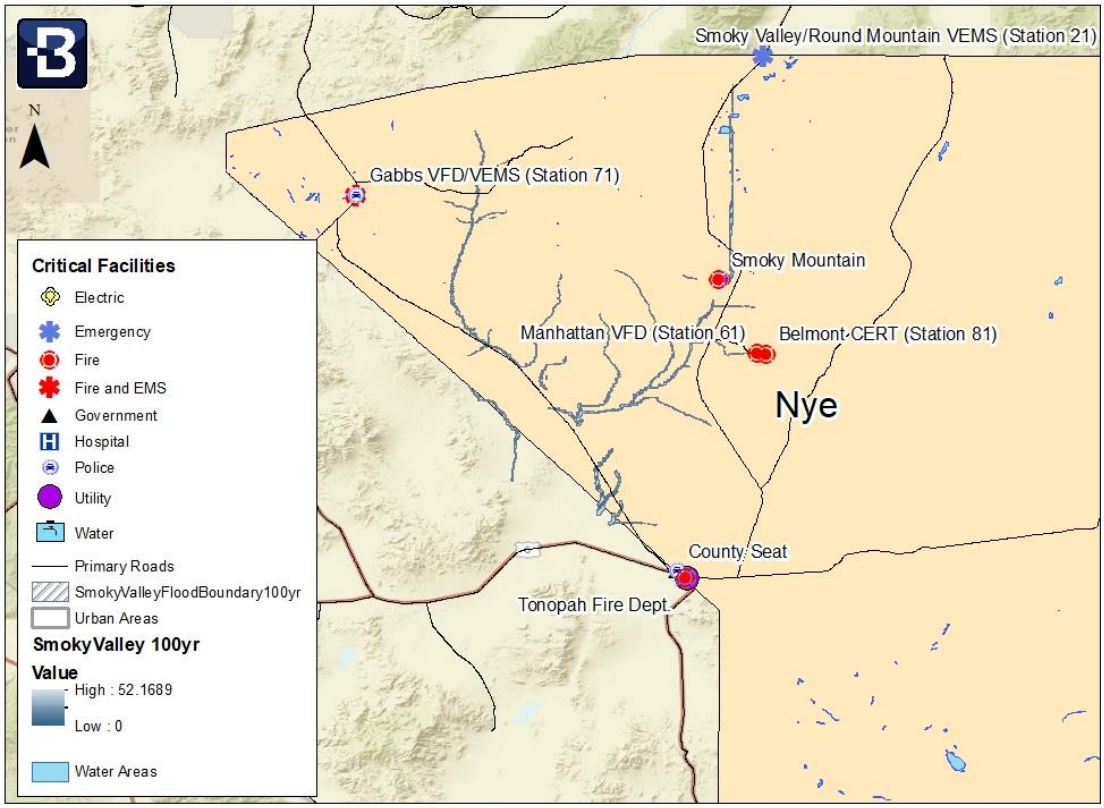
Source: Nye County

Map 45: Critical Facilities in Potential Flood Areas



Source: Nye County

Map 46: Critical Facilities in Potential Flood Areas



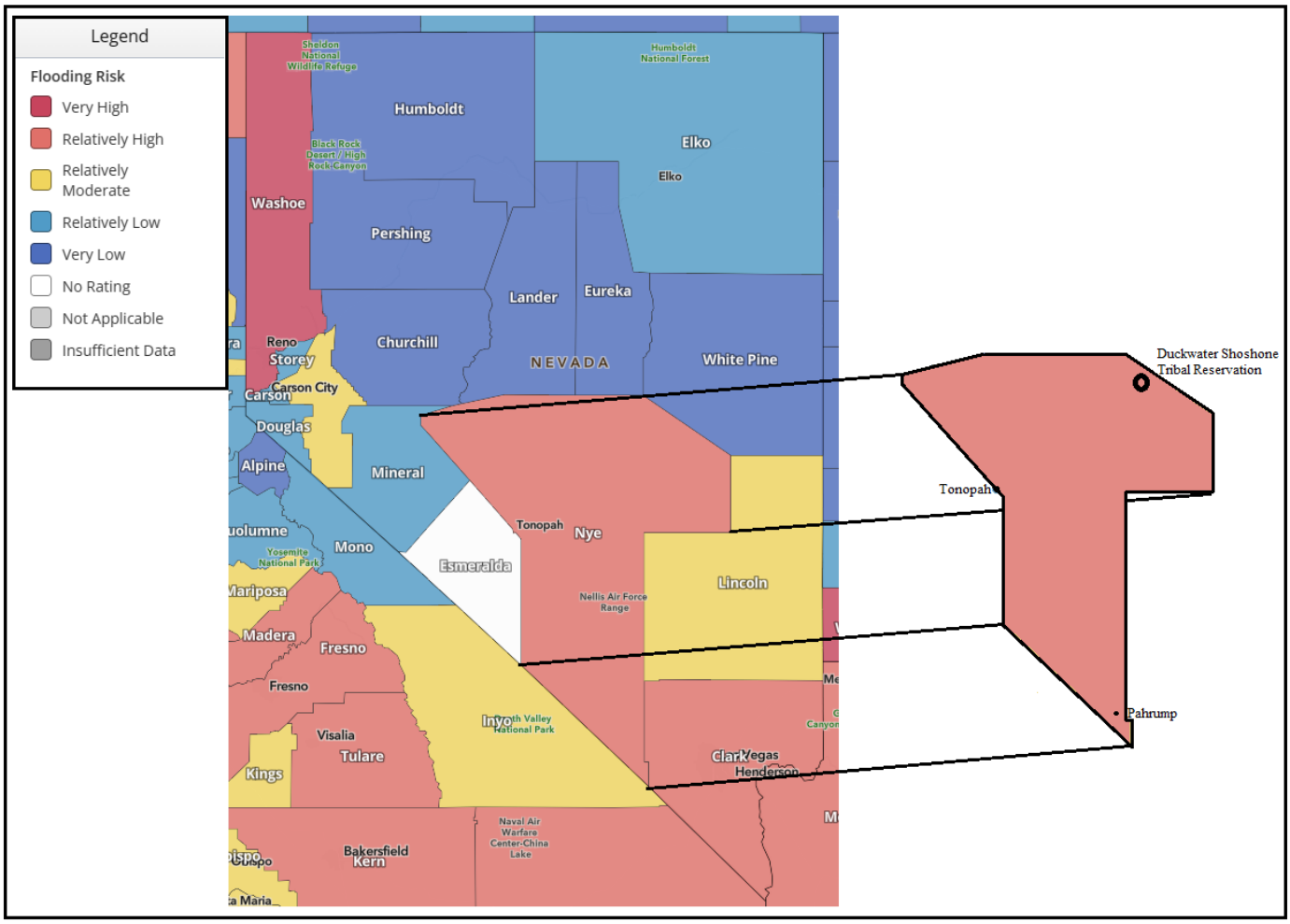
Source: Nye County

As per HAZUS, before the flood analyzed in this scenario, the Nye County had 25 hospital beds available for use. On the day of the scenario flood event, the model estimates that 25 hospital beds are available in the region.

Of particular concern related to flooding is the safety of citizens. Especially critical is timely evacuation orders, and adherence to those orders. If evacuation is not heeded, or flood waters rise quickly enough, citizens could drown or become trapped for extended periods of time with no access to services or medical care. Of special concern are long term care and medical facilities where it can take longer to evacuate, or evacuation may be impossible. Additionally, lower income citizens may not have the means to relocate, whether it be lack of transportation or lack of resources to afford temporary shelter.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map weas created indicating the potential risk to Nye County from flooding:

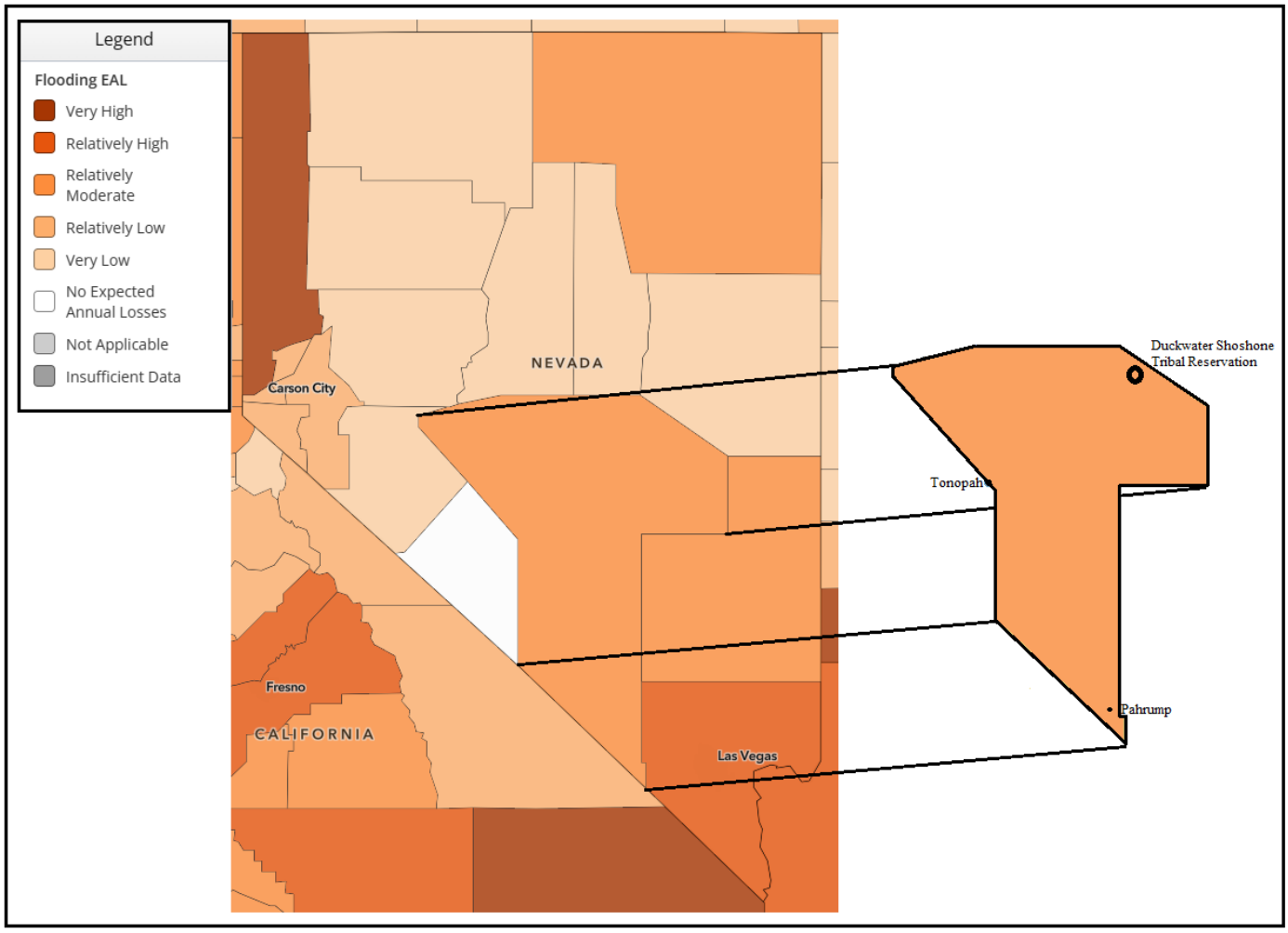
Map 47: FEMA NRI Flood Risk



Source: FEMA NRI

The following maps indicate the EAL for riverine flooding for Nye County:

Map 48: FEMA NRI Flood EAL



Source: FEMA NRI

4.11.6 Potential Impact of Climate Change

While well known as the driest state, Nevada has experienced many catastrophic floods. Because a warmer atmosphere can carry more water the most extreme storms are expected to become even more extreme. For example, projected near-term and long-term changes in peak annual runoff rates (the maximum daily runoff rate occurring during the average year) are projected to increase more than 25% to 50% above historical peak rates across much of the state, especially in and around many mountain ranges.

The Nevada State Climate Initiative fact sheet provides specific details about how climate change has already and will continue to impact the state of Nevada. It highlights historical trends and future projections for some major climate variables and how they may affect public health, water resources, the environment, hospitality and agriculture. The following table details how climate change will most likely impact the citizens of Nye County in relation to flood:

Table 64: Potential Impact of Climate Change, Floods

Area of Impact	Historical Trends
Public Health	Increased flooding would lead to greater risks to public safety, private property and public infrastructure, as well as decreasing water quality.
Water Resources	Flooding leads to decreased water quality and may limit the ability to capture rainwater and runoff for water supply, if too much water arrives too fast.

Table 64: Potential Impact of Climate Change, Floods

Area of Impact	Historical Trends
Environment	Increased flooding can increase erosion and water contamination. Pollution and sediment can have immediate effects on fish and other river and lake organisms. The increased erosion can also damage riparian habitats
Recreation and Hospitality	Flooding in urban centers and tourist destinations can impact visitation. Road closures due to flood and debris flow risk following wildfire may limit travel within the state.
Agriculture and Ranching	Flooding can increase erosion and soil loss, harm or contaminate crops, and damage water-holding and confinement structures.

Source: Nevada Climate Initiative

4.11.7 Land Use and Development Trends

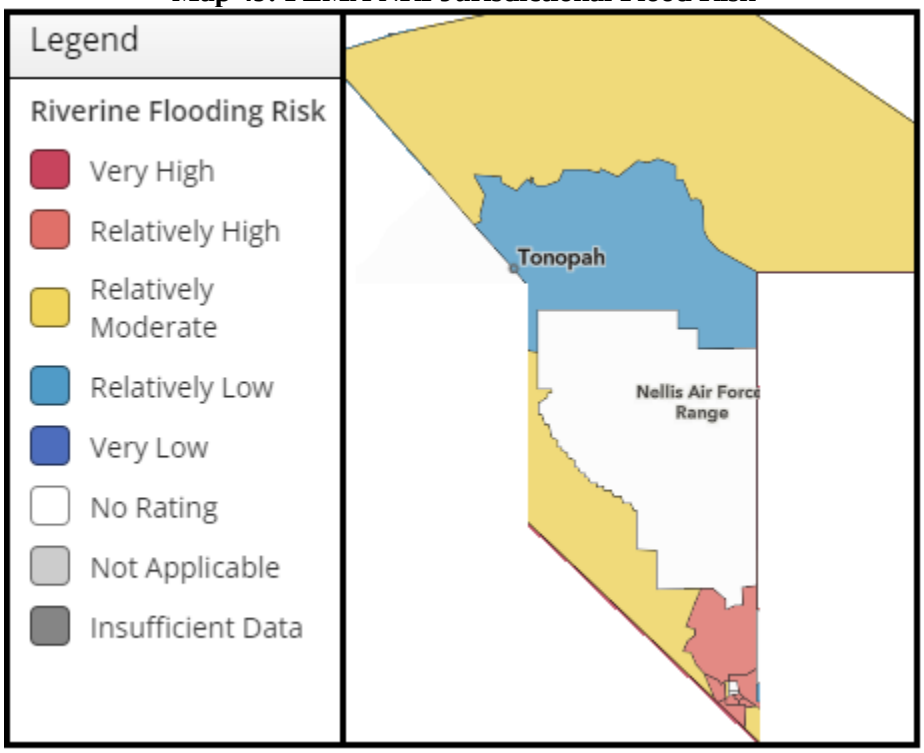
Nye County's and the Duckwater Shoshone Nation's current land-use regulations require the consideration of flood hazards during the development review process. Additionally, the generally static, or declining, nature of population growth during the past ten years in all participating jurisdictions and the Duckwater Shoshone Nation indicates that both current and future development may decline. As such, the vulnerability to flood events may decrease.

4.11.8 Jurisdictional Risk and Vulnerability

To help understand the risk and vulnerability to flood conditions of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map was created indicating the potential risk to participating jurisdictions (as indicated by census tract) from flood events:

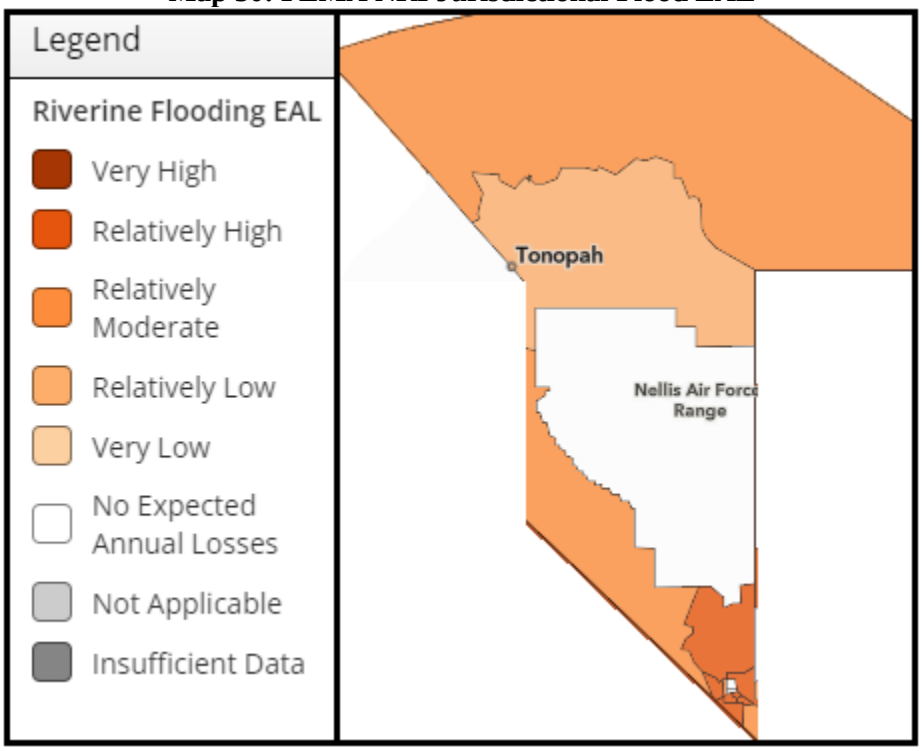
Map 49: FEMA NRI Jurisdictional Flood Risk



Source: FEMA NRI

As part of the NRI, EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk. The following map indicates the EAL for flood for participating jurisdictions (as indicated by census tract) within Nye County:

Map 50: FEMA NRI Jurisdictional Flood EAL



Source: FEMA NRI

The following table indicates the FEMA NRI and EAL analysis for each participating jurisdiction for flooding:

Table 65: Nye County FEMA NRI and EAL for Flooding by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Flood NRI	Relatively Moderate	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low
Flood EAL	Relatively Low	Relatively Low	Relatively Low	Very Low	Very Low

Source: FEMA NRI

All jurisdictional and Duckwater Shoshone Nation citizens and structures are vulnerable to flash flood events. Using FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building valuation for each participating jurisdiction:

Table 66: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Population	Building Valuation
Amargosa Valley	480	$784,272,611
Duckwater Shoshone Tribe	219	$338,951,854
Pahrump	36,441	$7,423,893,881
Round Mountain	933	$338,951,854
Tonopah	2,179	$893,781,986

Source: FEMA NRI and U.S. Census Bureau

Potentially Vulnerable Community Lifelines

Flooding can have significant and widespread impacts on road infrastructure. The extent of the damage depends on factors such as the severity and duration of the flood, the type of flooding (river overflow, flash flooding), and the design and resilience of the road infrastructure. Impacts may include:

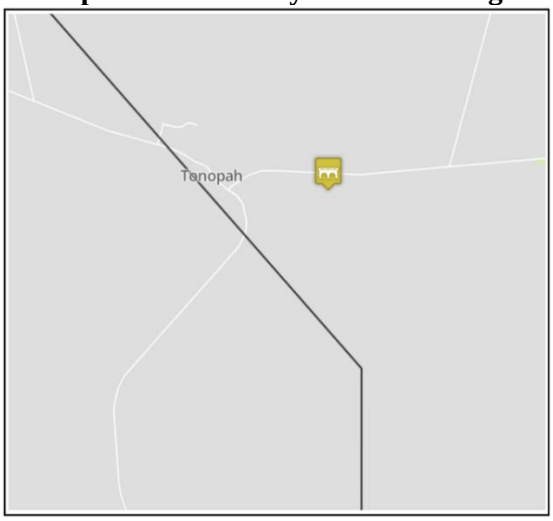
- Structural Damage: Floodwaters can erode road surfaces, weaken foundations, and damage bridges and culverts. The force of flowing water can undermine the structural integrity of roads and cause washouts.
- Road Surface Erosion: The erosion caused by floodwaters can remove the top layer of road surfaces, leading to potholes, cracks, and a general deterioration of the road condition.
- Subsidence and Sinkholes: The infiltration of water into road foundations can cause subsidence or create sinkholes.
- Debris Accumulation: Floodwaters often carry debris such as logs, branches, and sediment. The accumulation of debris on roads can impede drainage systems, block culverts, and hinder the flow of water.
- Road Closures: Flooding can result in the closure of roads due to safety concerns. High water levels, washouts, or structural damage may make roads impassable, leading to disruptions in transportation.
- Loss of Road Markings and Signs: Floodwaters can wash away road markings and signs, reducing visibility and creating safety hazards for motorists.
- Long-Term Damage: Even after floodwaters recede, long-term damage to road infrastructure may persist. Subsurface waterlogging, soil destabilization, and residual structural weaknesses can contribute to ongoing deterioration.

Mapping concerning roads in Nye County may be found in Section 4.10.8.

The cost to conduct maintenance on a road can vary significantly depending on the types of work required. However, the average estimate for repairs on a per mile basis in 2019 was $14,750 per mile. The cost to replace a road can vary significantly based on several factors, including the type of road, local labor and material costs, the complexity of the project, and the specific requirements of the replacement. As a rough estimate, road construction costs can range from $1,000,000 to $10,000,000 per mile.

Of particular concern are structurally deficient bridges, which may be at increased risk of failure during a flood event. One bridge within Nye County has been identified by the Nevada Department of Transportation as being of particular concern. Constructed in 1936 on US Highway 6 near Tonopah, and crossing the Ralston Wash, this deficient bridge sees approximately 1,800 crossings per day.

Map 51: Structurally Deficient Bridge



Source: State of Nevada

Flooding can have substantial and often severe impacts on electrical utilities, disrupting power generation, transmission, and distribution systems. The consequences of flooding on electrical utilities can vary depending on factors such as the depth and duration of the flooding and the type of infrastructure affected, and may include:

- Substation and Power Plant Damage: Floodwaters can inundate electrical substations and power plants, damaging critical equipment such as transformers, switchgear, and control systems. Substantial damage to these facilities can lead to prolonged outages.
- Electrical Equipment Short-Circuits: Water infiltration into electrical equipment can cause short-circuits, leading to equipment failure and potentially causing fires. This can result in widespread power outages and safety hazards.
- Transmission Line Disruptions: Floodwaters can impact the stability of transmission towers and lines. Structural damage or collapse of transmission infrastructure can disrupt the flow of electricity over long distances.
- Distribution Network Damage: Localized flooding can damage distribution infrastructure, including power lines, poles, and transformers. This can lead to outages in specific neighborhoods or communities.
- Transformer Submersion: Floodwaters can submerge transformers, which are critical components in power distribution. Submersion can cause these transformers to malfunction or fail, leading to service interruptions.
- Underground Cable Damage: Underground power cables can be damaged by flooding, especially in areas with subterranean infrastructure. Water infiltration can compromise cable insulation, leading to electrical faults and outages.
- Loss of Fuel Supply: Natural gas power plants may face challenges in maintaining a stable fuel supply if transportation routes are disrupted due to flooding.

Mapping concerning electrical generation plants and high-capacity transmission lines may be found in Section 4.9.8.

Jurisdictions seeing either an increase in population or an increase in occupied housing units may be at increased risk to flood events. The following represent participating jurisdictions that have seen an increase in either of those parameters:

- Nye County: Increase in occupied housing units and increase in population (largely in Pahrump)
- Round Mountain: Increase in occupied housing units

All other participating jurisdictions (Amargosa Valley, Duckwater Shoshone Tribe, and Tonopah) have seen either a static state or decrease in both population and occupied housing units.

4.11.9 National Flood Insurance Program Communities

The NFIP is a federal program, managed by FEMA, that exists to provide flood insurance for property owners in participating communities, to improve floodplain management practices, and to develop maps of flood hazard areas. The following table presents NFIP participating communities:

Table 67: Nye County NFIP Communities

Community	Initial Flood Hazard Boundary Map Identified	Initial Flood Insurance Rate Map Identified	Current Effective Map Date
Nye County	10/18/74	04/12/83	03/06/20

All other participating jurisdictions in Nye County have elected not to participate in the NFIP due to lack perceived need.

Additionally, the NFIP's Community Rating System (CRS) incentive rewards communities for the work they do managing their floodplains. Eligible communities that qualify for this voluntary program go above the minimum NFIP

requirements and can offer their citizens discounted flood insurance in both SFHAs areas and non-SFHA areas. No Nye County communities currently participate in the CRS.

4.11.10 FEMA Flood Policy Data

Nye County flood policy information was sourced from FEMA's Flood Insurance Data and Analytic, Nye County, and the State of Nevada. The number of flood insurance policies in effect may not include all structures at risk to flooding, and some properties are under-insured. The flood insurance purchase requirement is for flood insurance in the amount of federally backed mortgages, not the entire value of the structure. Additionally, contents coverage is not required.

The following table shows the details of NFIP policy statistics for Nye County:

Table 68: Nye Policy and Loss Statistics

Jurisdiction	Number of Policies in Force	Total Coverage
Nye County	3,408	$1,578,113

Source: FEMA Flood Insurance Data

4.11.11 Repetitive Loss Structures

A high priority for potential flood mitigation is a reduction of losses from Repetitive Loss (RL) and Severe Repetitive Loss (SRL) structures. The NFIP defines a RL property as:

- Any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. At least two of the claims must be more than 10 days apart.

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both of the above, at least two of the referenced claims must have occurred within any ten-year period and must be greater than ten days apart.

No RL or SRL structures have been identified in Nye County or any of its participating jurisdictions.

4.12 Severe Thunderstorm

4.12.1 Hazard Description

Severe thunderstorms comprise the hazardous and damaging weather effects often found in violent storm fronts. They can occur together or separate, they are common and usually not hazardous, but on occasion they can pose a threat to life and property.

This plan defines severe thunderstorms as a combination of the following severe weather effects as defined by NOAA and the National Weather Service (NWS).

- **Hail:** Precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud.
- **Lightning:** A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud.
- **Thunderstorm Winds:** The same classification as high or strong winds but accompanies a thunderstorm. It is also referred to as a straight-line wind to differentiate from rotating or tornado associated wind. Additionally, these winds can rapidly create dust storms that severely impact visibility.

Severe thunderstorms have been so consistent throughout modern history that much of the vulnerability is mitigated. However, this section is not concerned with everyday wind, lightning in the sky, or mild precipitation. This section is concerned with common storm elements when they behave such that they pose a threat to property and life.

4.12.2 – Location and Extent

Severe thunderstorms can rapidly descend on an area, but in many cases are predictable. Most weather forecasts focus on more than just temperature but on quickly changing conditions that may lead to the onset of severe storms. All of Nye County is susceptible to severe thunderstorms.

The NWS classifies thunderstorms, often the generator of hail, lightning and high winds, using the following categories.

- **Marginal:** Isolated severe thunderstorms, limited in duration and/or coverage and/or intensity
- **Slight:** Scattered severe storms possible, short-lived and/or not widespread, isolated intense storms possible
- **Enhanced:** Numerous severe storms possible, more persistent and/or widespread, a few intense
- **Moderate:** Widespread severe storms likely, long-lived, widespread and intense
- **High:** Widespread severe storms expected, long-lived, very widespread and particularly intense

In the United States, hail causes billions of dollars in damage to property each year. Vehicles, roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail. Hail has been known to cause injury and the occasional fatality to humans, often associated with traffic accidents.

Based on information provided by the National Weather Service concerning size, the following table describes potential damage impacts of the various sizes of hail.

Table 69: Hail Size Comparison and Damage Descriptions

Diameter (inches)	Size Description	Potential Damage Impacts
1/4	Pea Size	No damage
1/2	Mothball, peanut, USB Plug	Slight damage to vegetation
3/4	Penny Size	Increased damage to crops and vegetation
7/8	Nickel Size	Severe damage to crops and vegetation, damage begins to glass and plastic

Table 69: Hail Size Comparison and Damage Descriptions

Diameter (inches)	Size Description	Potential Damage Impacts
1	Quarter Size	Increased glass damage, damage begins to bodies of vehicles
1 1/4	Half Dollar Size	Large scale glass damage, begin roof damage, risk of injury to exposed persons
1 1/2	Ping Pong Ball Size	Large scale glass damage, begin roof damage, increased risk of injury to exposed persons
1 3/4	Golf Ball Size	Severe roof damage, risk of serious injuries to exposed persons
2	Lime or Medium Sized Hen Egg	Potential structural damage, risk of very severe injuries to exposed persons
2 1/2	Tennis Ball Size	Extensive structural damage, risk of very severe injuries or death to exposed persons

Source: National Weather Service

A recent report by the Insurance Information Institute says lightning strikes caused $1,300,000,000 in damage across the United States in 2021. There is currently no scale to indicate the severity of a lightning strike, but data from NOAA indicates that there approximately 25 million cloud-to-ground lightning strikes per year in the United States.

To measure wind speed and its correlating potential for damage, experts use the Beaufort scale as shown in the following table:

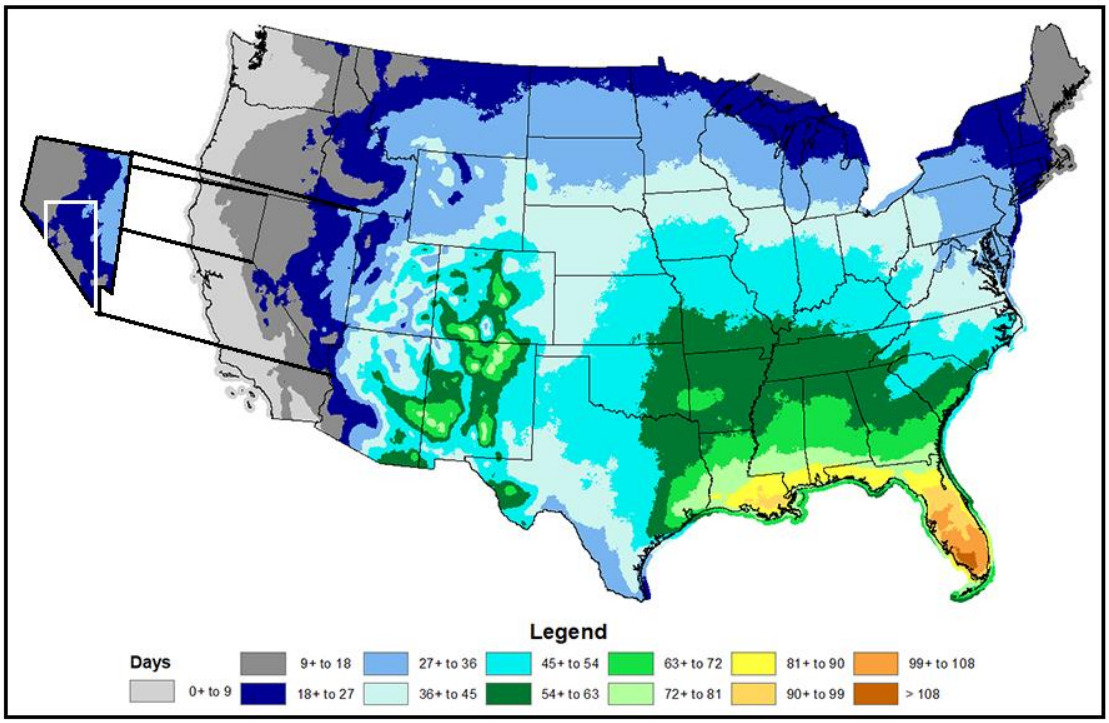
Table 70: Beaufort Scale

Beaufort Number	Wind Speed (mph)	Effects on Land
0	Under 1	Calm, smoke rises vertically
1	1-3	Smoke drift indicates wind direction, vanes do not move
2	4-7	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Leaves, small twigs in constant motion. Light flags extended.
4	13-18	Dust, leaves and loose paper raised up, small branches move
5	19-24	Small trees begin to sway
6	25-31	Large branches of trees in motion, whistling heard in wires
7	32-38	While trees in motion, resistance felt in walking against the wind
8	39-46	Twigs and small branches broken off trees
9	47-54	Slight structural damage occurs, slate blown from roofs
10	55-63	Seldom experienced on land, trees broken, structural damage occurs
11	64-72	Very rarely experienced on land, usually with widespread damage
12	73 or higher	Violence and destruction

Source: NOAA

The infrequent nature of thunderstorms makes hail, lightning, and high wind a relatively uncommon occurrence for Nye County. The following map, from NOAA, indicates annual mean thunderstorm days from 1993 to 2018.

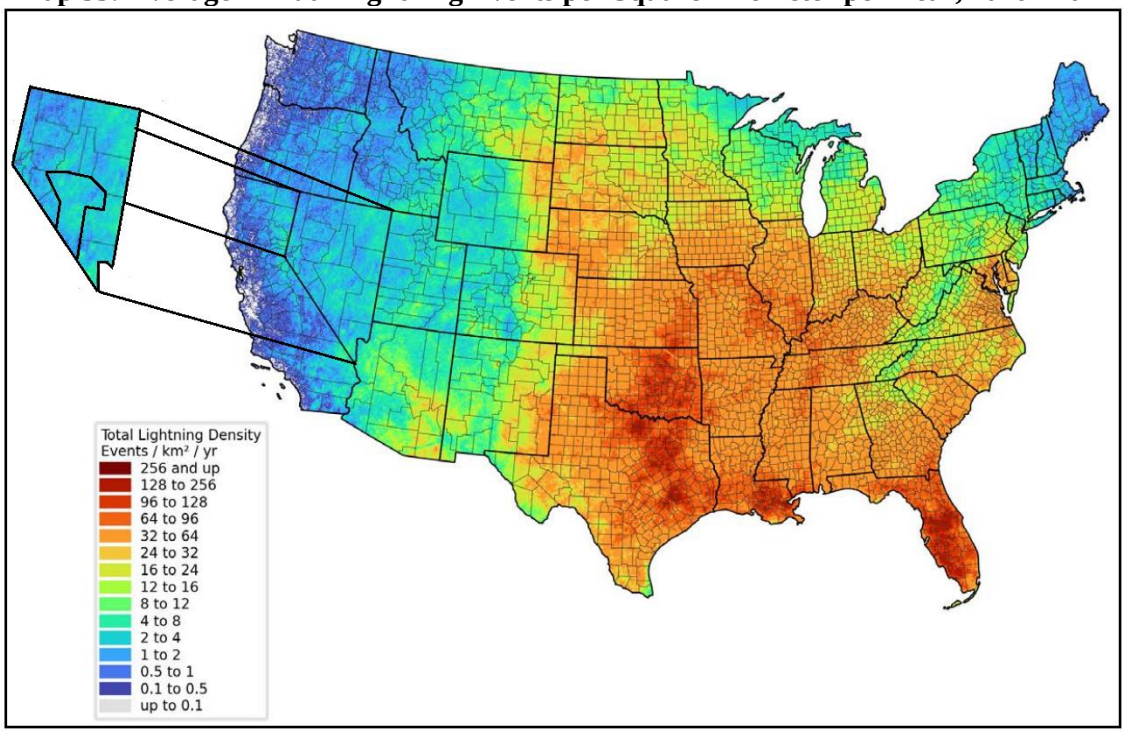
Map 52: Annual Mean Thunderstorm Days, 1993-2018



Source: NOAA

The following map, from Vaisala, indicates the average annual light events per square kilometer per year for Nye County.

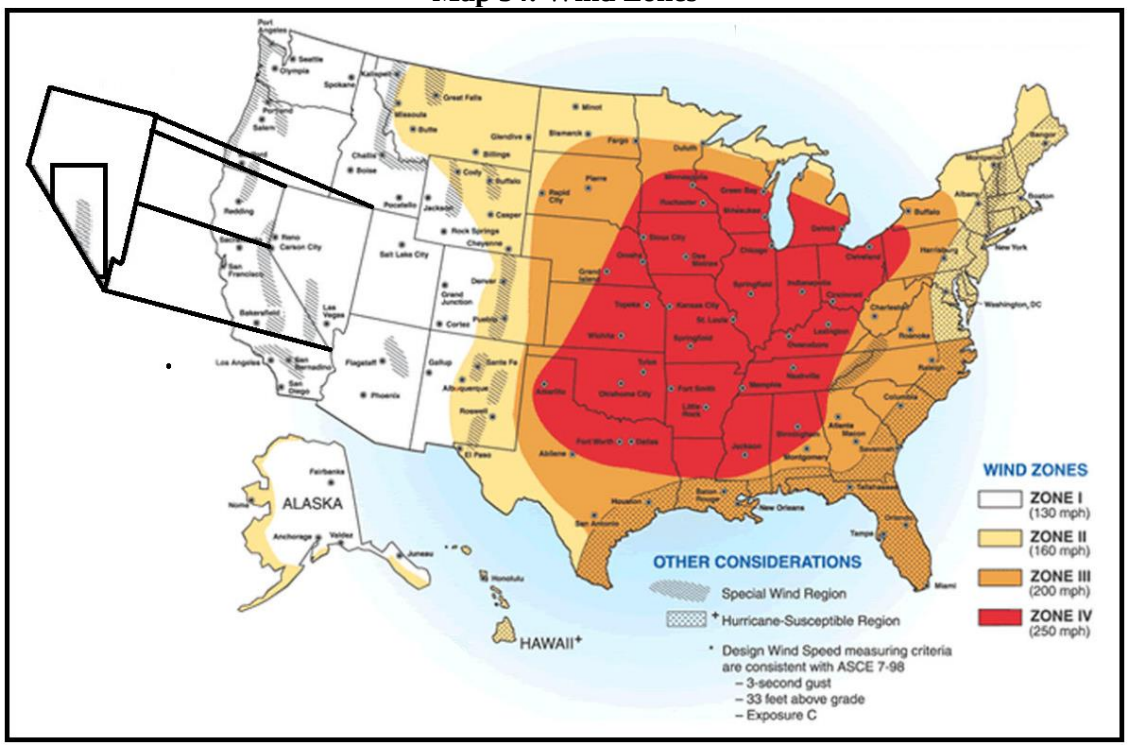
Map 53: Average Annual Lightning Events per Square Kilometer per Year, 2016 - 2022



Source: Vaisala

The following wind region map from the National Institute of Standards and Technology details wind zones in the United States. As illustrated on the map, part of Nye County is designated a Special Wind Zone, defined by the NWS as having the potential for sustained surface wind speeds exceeding 50 knots (54 mph) for 20 days per year with some qualification requirements for damage amounts during any 24-hour period.

Map 54: Wind Zones



Source: National Institute of Standards and Technology

Severe thunderstorms can occur anywhere in Nye County, including all jurisdictions and the entire Duckwater Shoshone Nation Tribal Reservation.

4.12.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. In the 20-year period from 2003 to 2022, with the years 2003 and 2022 being full dataset years, Nye County has experienced no Presidential Disaster Declarations related to severe thunderstorms.

In addition to the Presidentially Declared Disasters, the following table presents NCEI identified severe thunderstorm events and the resulting damage totals in Nye County from 2003 to 2022. with the years 2003 and 2022 being full dataset years. Please note that as severe thunderstorm events tend to cover larger areas occurrence data is being presented as representative of all participating jurisdictions.

Table 71: Nye County NCEI Severe Thunderstorm Events, 2003-2022

Event Type	Number of Events	Property Damage	Crop Damage	Deaths	Injuries
Hail	6	$0	$0	0	0
Lightning	5	$77,000	$0	1	1
Thunderstorm Winds	63	$170,000	0	0	1

Source: NCEI

The following provides both local accounts and NCEI descriptions of notable recorded events:

- **July 25, 2021, Pahrump:** Roofs were blown off multiple structures, trees three to four feet in diameter were snapped, and car windows were broken. Damage was estimated at $100,000.
- **October 4, 2015, Amargosa Valley:** Lightning struck three power poles in Amargosa Valley.. Damages were recorded at $30,000.
- **September 20, 2014, Rhyolite:** Lightning struck and set fire to the abandoned historic Rhyolite Mercantile Building, destroying it. Damages were estimated at $25,000.
- **July 8, 2006, Tonopah:** A 16-year-old boy was struck and killed by lightning when he and his dad got out of their pickup truck to check the tires. His father was thrown to the ground when lightning struck. The father was taken to the hospital for treatment and released. The boy's mother and sister stayed in the truck and were unharmed.

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event oftentimes the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

This hazard is regional in nature, and occurrences for participating jurisdictions and the entire Duckwater Shoshone Nation Reservation are not unique from Nye County as a whole.

4.12.4 Probability of Future Events

Predicting the probability of severe thunderstorm occurrences is tremendously challenging due to the large number of factors involved and the random nature of formation. Data from the NCEI indicates that Nye County can expect on a yearly basis, relevant to severe thunderstorm events, the following:

Table 72: Nye County and Participating Jurisdictions Severe Thunderstorm Probability Summary

Data	Days
Number of Days with NCEI Reported Event (2003-2022)	74
Average Events per Year	4

Source: NCEI

The probability of a future occurrence of this hazard is not unique to any participating jurisdiction, or the Duckwater Shoshone Nation Reservation, from Nye County as a whole.

4.12.5 Vulnerability and Impact

Severe storms have the ability to impact the entire planning area, and all participating jurisdictions are at risk to thunderstorm event impacts. Unfortunately, there is no accurate method of predicting the location or extent of a severe storm's impact or location. It is not possible to predict any varying probability between the participating jurisdictions with the exception of varying risk as it is proportionate to a participating jurisdiction's demographics. Logically, participating jurisdictions with a greater population are at a higher risk as participating jurisdictions with a lower population are at a lower risk.

Data from the NCEI indicates that Nye County can expect on a yearly basis, relevant to severe thunderstorm events. Please note that damages and injuries, as represented above, are not broken down into participating jurisdictions due to the random and widespread nature of occurrence.

Table 73: Nye County Severe Thunderstorm Impact Summary

Data	Recorded Impact
Deaths or Injuries (2003-2022)	2
Average Number of Deaths or Injuries	<1

Table 73: Nye County Severe Thunderstorm Impact Summary

Data	Recorded Impact
Total Reported NCEI Property Damage (2003-2022)	$247,000
Average Property Damage per Year	$12,350

Source: NCEI

Data from HAZUS was used to provide a county building stock valuation. This data was then compared to NCEI structural damage figures to determine the percentage of impacted building within the county for the period of 2003-2022 for each severe storm component. Data was only available at a county level.

Table 74: Nye County Severe Storm Percentage Loss Data

Hazard	HAZUS Valuation	NCEI Structure Damage, 2003-2022	Percentage of Building Valuation Damaged
Hail	$9,777,388,000	$0	0%
Lightning	$9,777,388,000	$77,000	0.001%
Wind	$9,777,388,000	$170,000	0.002%

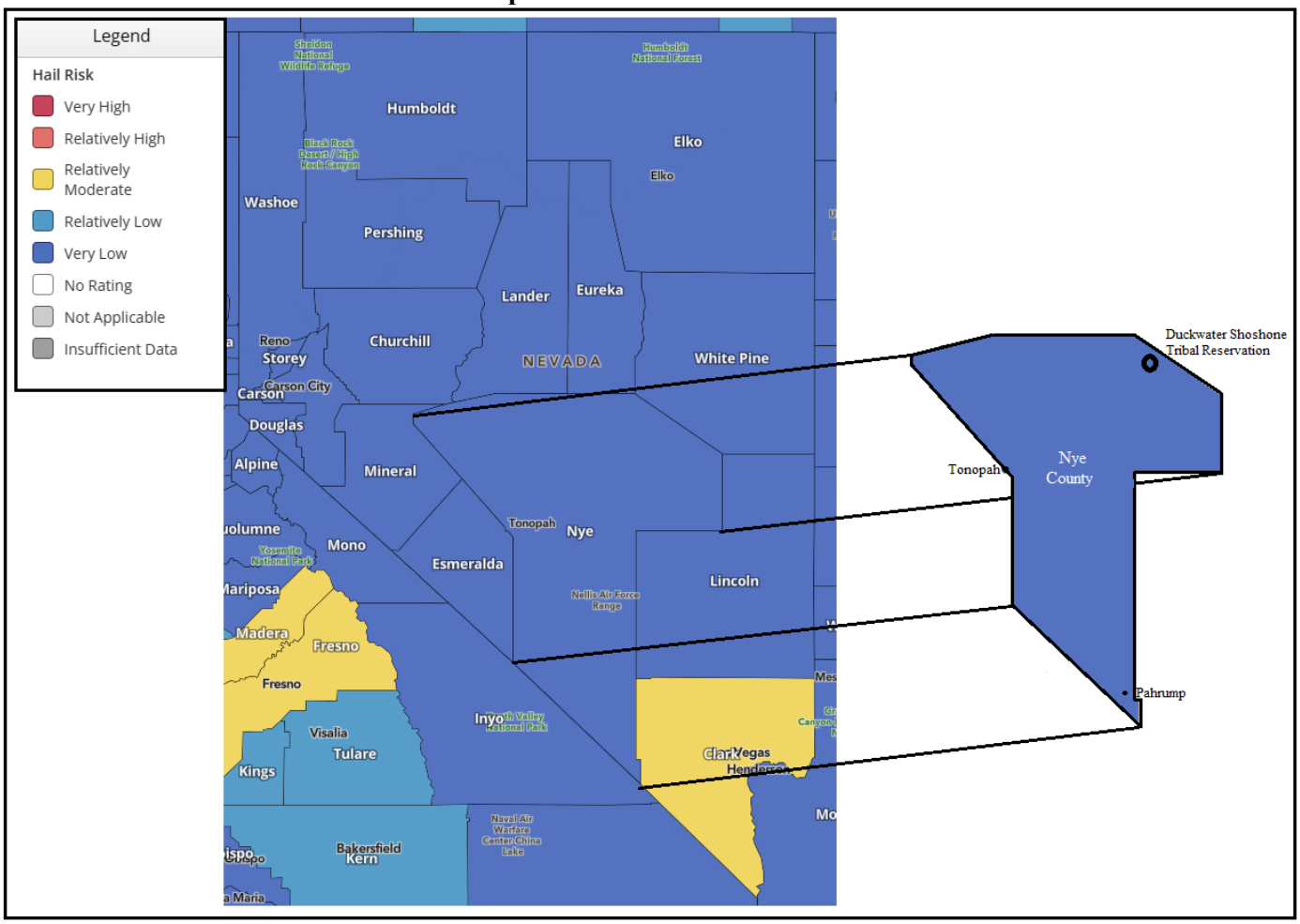
Source: NCEI and Nye County

While difficult to quantify, as the impacts of future severe storms will be determined by many factors, the impacts of severe storms may be widespread. In the absence of proper shelter, hail, lightning, and high winds can cause serious injury. In general, if potentially exposed persons take shelter in a well-constructed structure protection from these severe thunderstorm components would be provided. Additionally, severe thunderstorms can impact facilities and infrastructure in the following ways:

- Unable to be accessed due surrounding conditions
- Loss of utilities due to downed lines
- Structural damage or complete structural failure

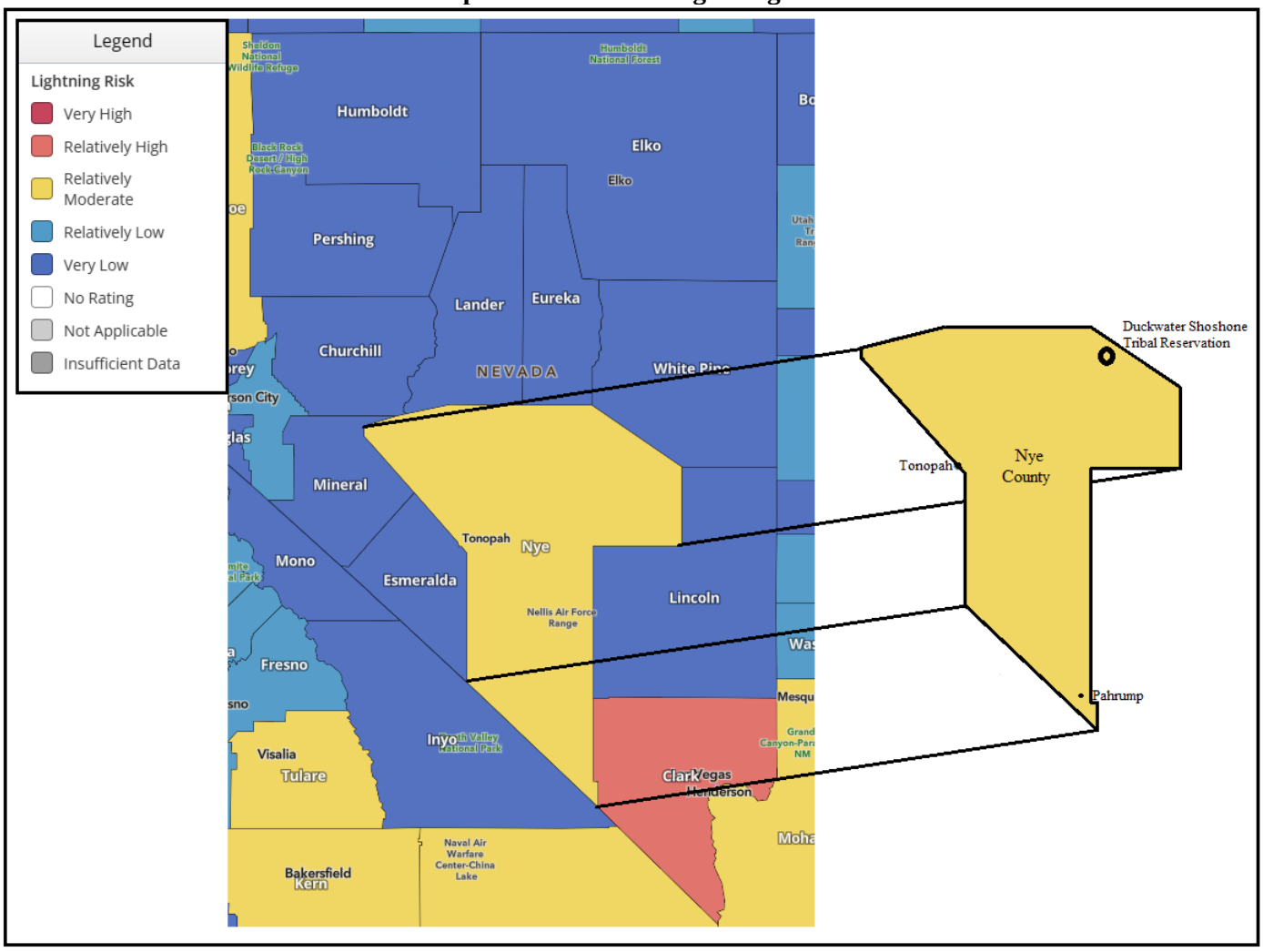
Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following maps were created indicating the potential risk to Nye County from hail, lighting, and strong wind:

Map 55: FEMA NRI Hail Risk



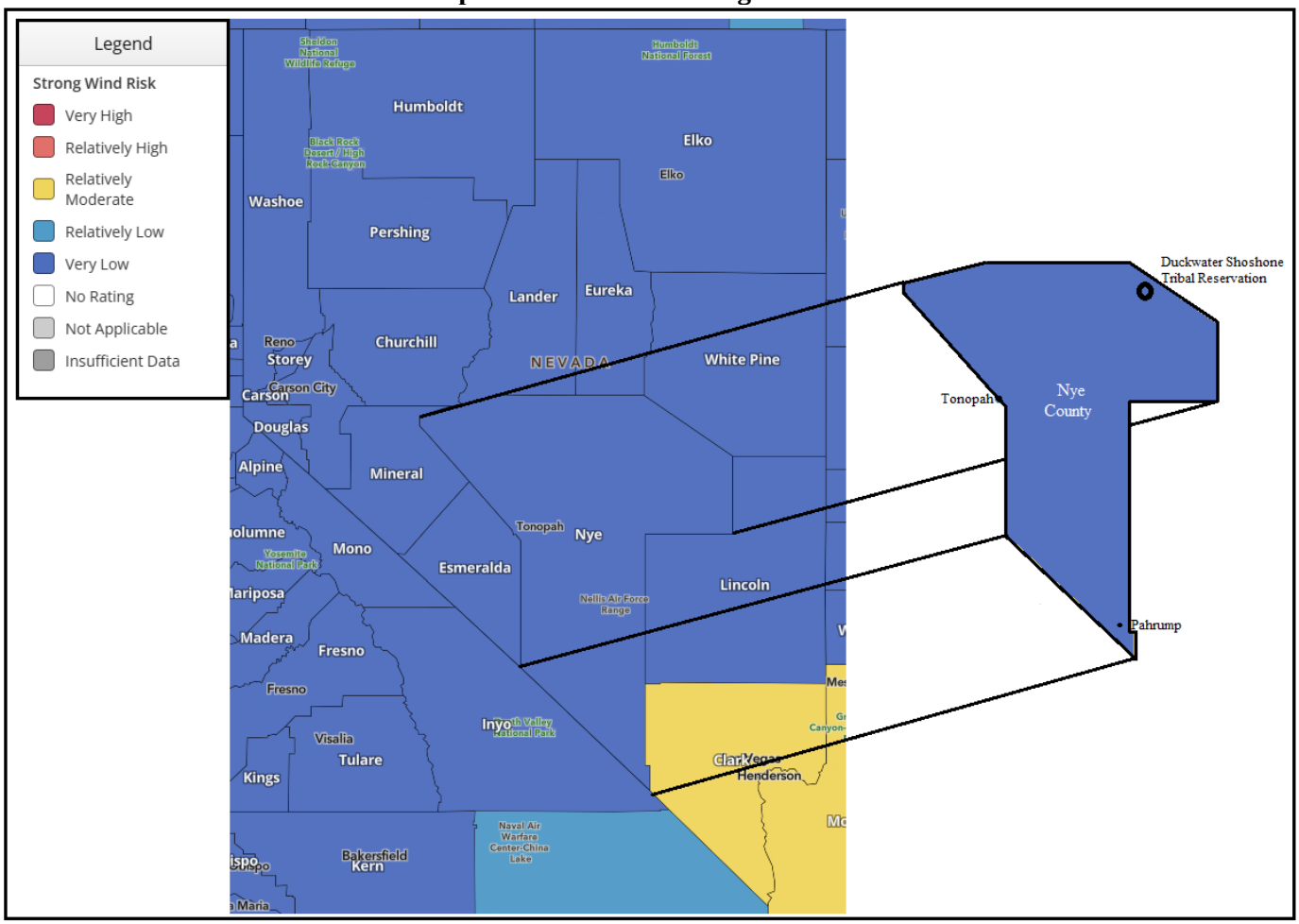
Source: FEMA NRI

Map 56: FEMA NRI Lightning Risk



Source: FEMA NRI

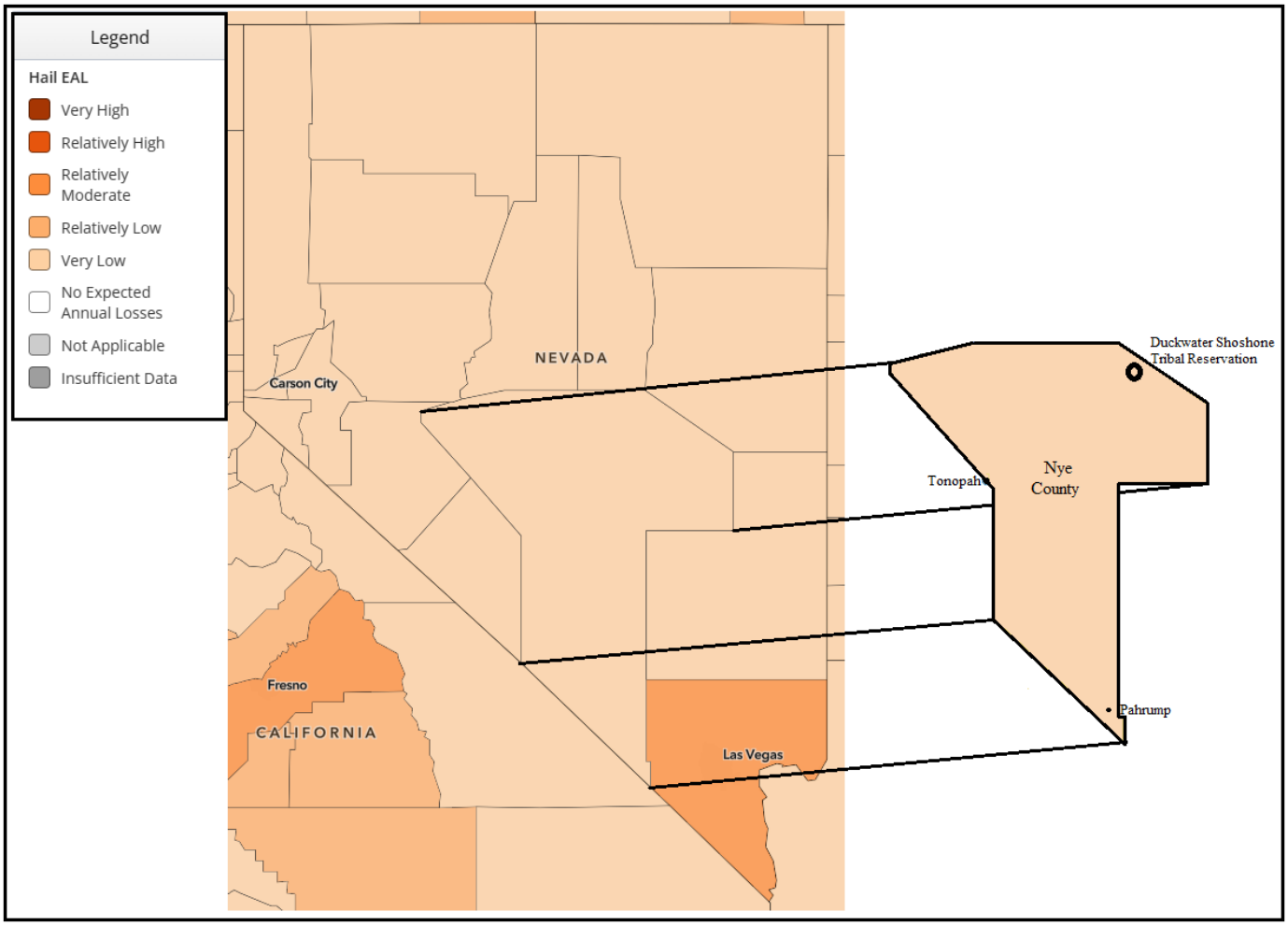
Map 57: FEMA NRI Strong Wind Risk



Source: FEMA NRI

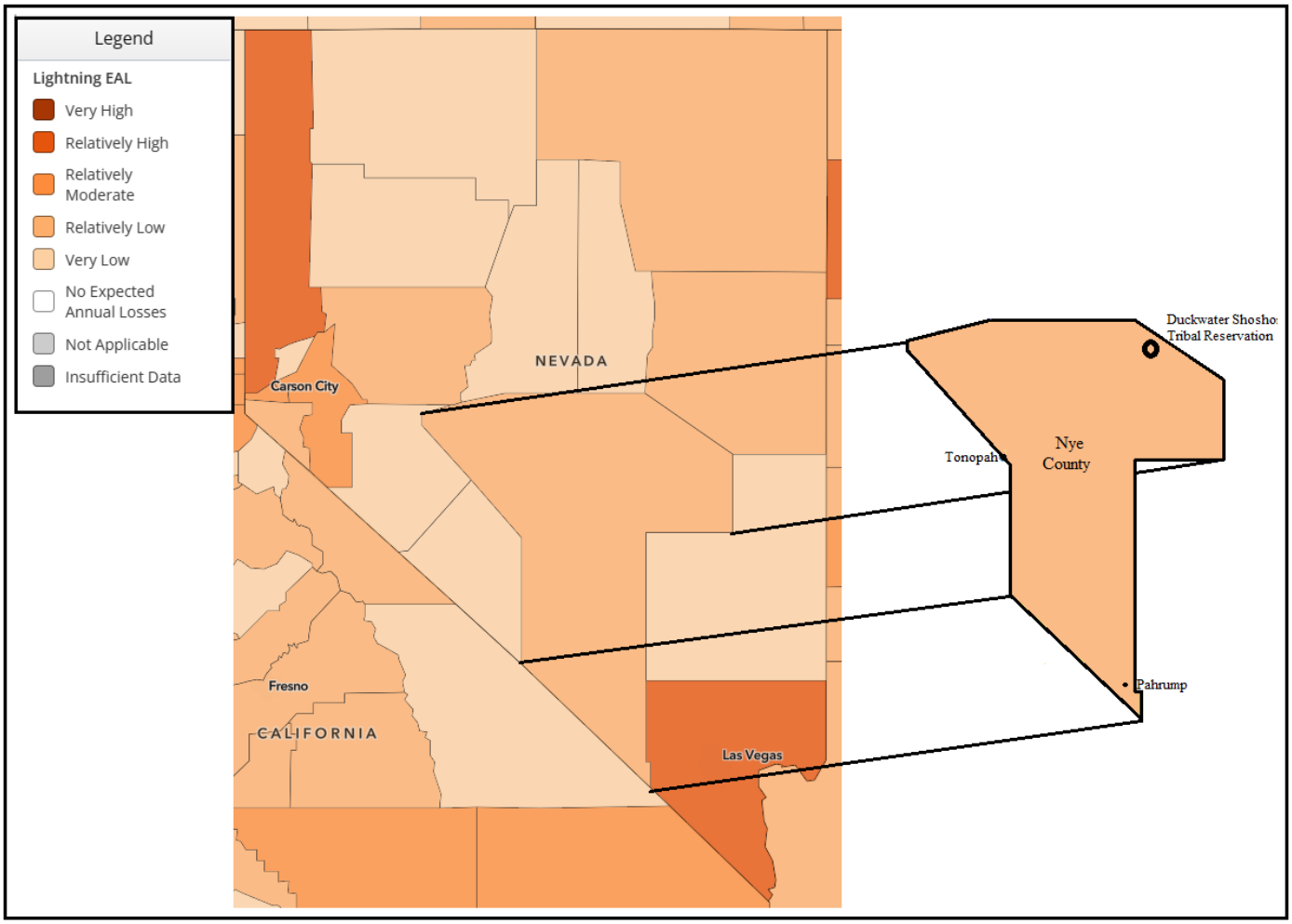
The following maps indicate the EAL for hail, lightning, and strong wind for Nye County:

Map 58: FEMA NRI Hail EAL



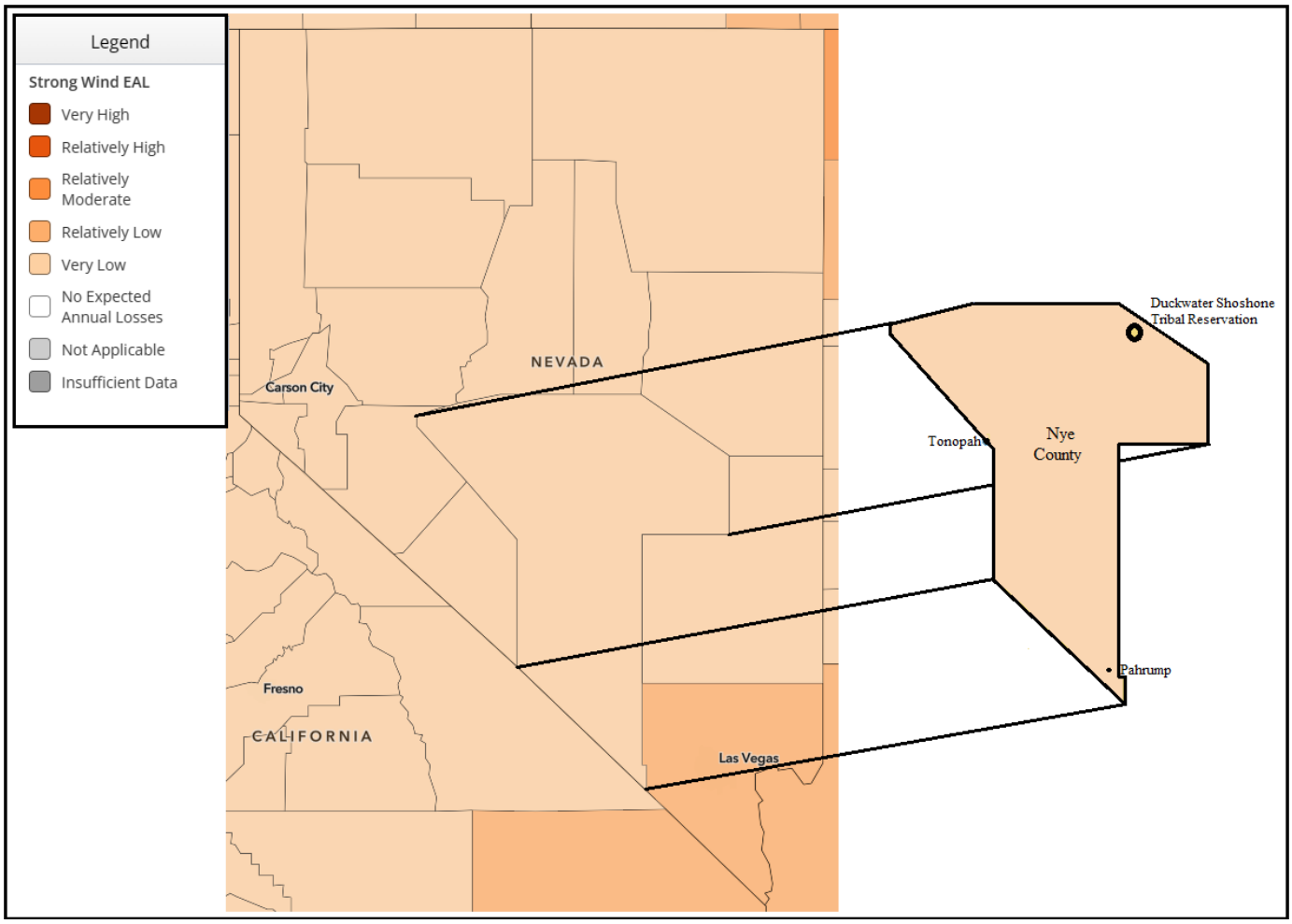
Source: FEMA NRI

Map 59: FEMA NRI Lightning EAL



Source: FEMA NRI

Map 60: FEMA NRI Strong Wind EAL



Source: FEMA NRI

4.12.6 Potential Impact of Climate Change

Rising global average temperature can be associated with more frequent and more intense severe thunderstorms. One of the major factors that drive thunderstorm formation is convective available potential energy, a measure of how much energy is available for storm formation. Available scientific evidence indicates that increasing temperatures should increase convective available potential energy by warming the surface and putting more moisture in the air through evaporation, potentially increasing formation occurrence and severity.

4.12.7 Land Use and Development Trends

Development trends speak to the potential impacts of land use and demographic changes in hazard prone areas. Data in this section is speculative, as future conditions are subject to numerous unpredictable factors.

As indicated in the data above, Nye County, participating jurisdictions, and the Duckwater Shoshone Nation have been seeing generally static or declining populations. A static or declining population could decrease population risks to severe storms by nature of their being fewer citizens and Tribal members to negatively impact.

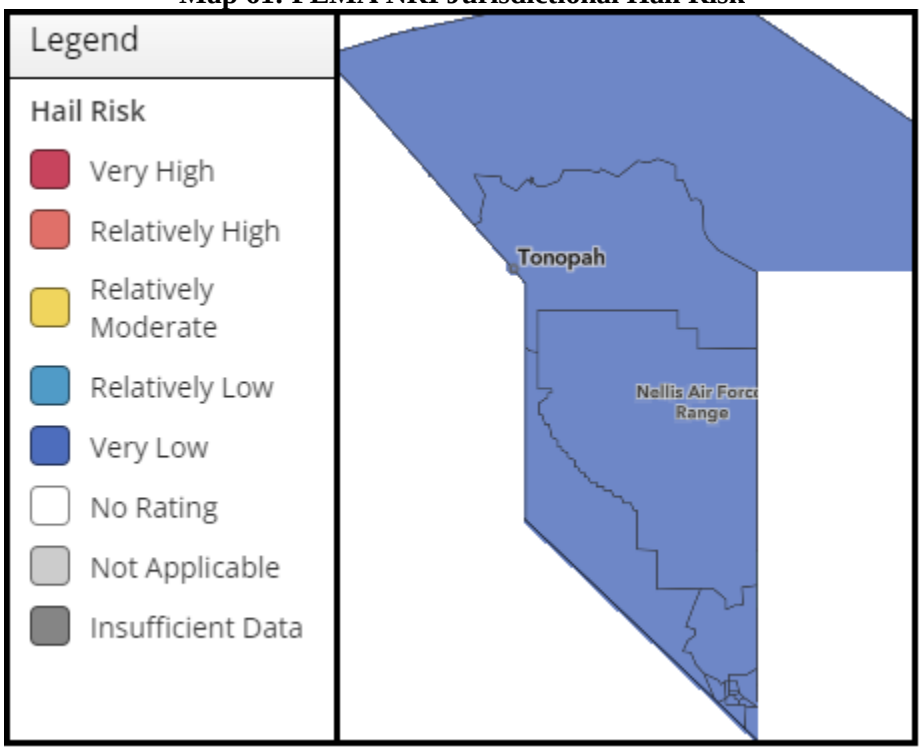
Nye County's and the Duckwater Shoshone Nation's current land-use regulations require the consideration of building codes during the development review process. A building-by-building structural review, including roof profile, type and strength of windows, and foundation systems would need to be considered to determine structural risk. However, enforced building codes can ensure that newly built and renovated structures can withstand all but the most extreme weather incidents.

4.12.8 Jurisdictional Risk and Vulnerability

To help understand the risk and vulnerability to severe thunderstorm conditions of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

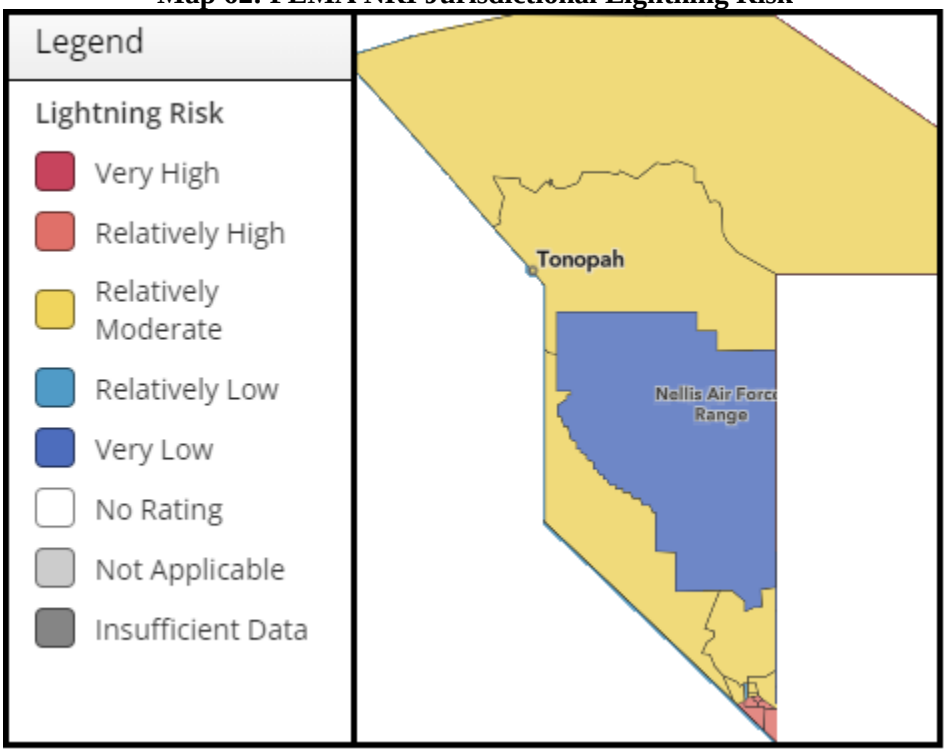
Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map was created indicating the potential risk to participating jurisdictions (as indicated by census tract) from the components of severe thunderstorm events:

Map 61: FEMA NRI Jurisdictional Hail Risk



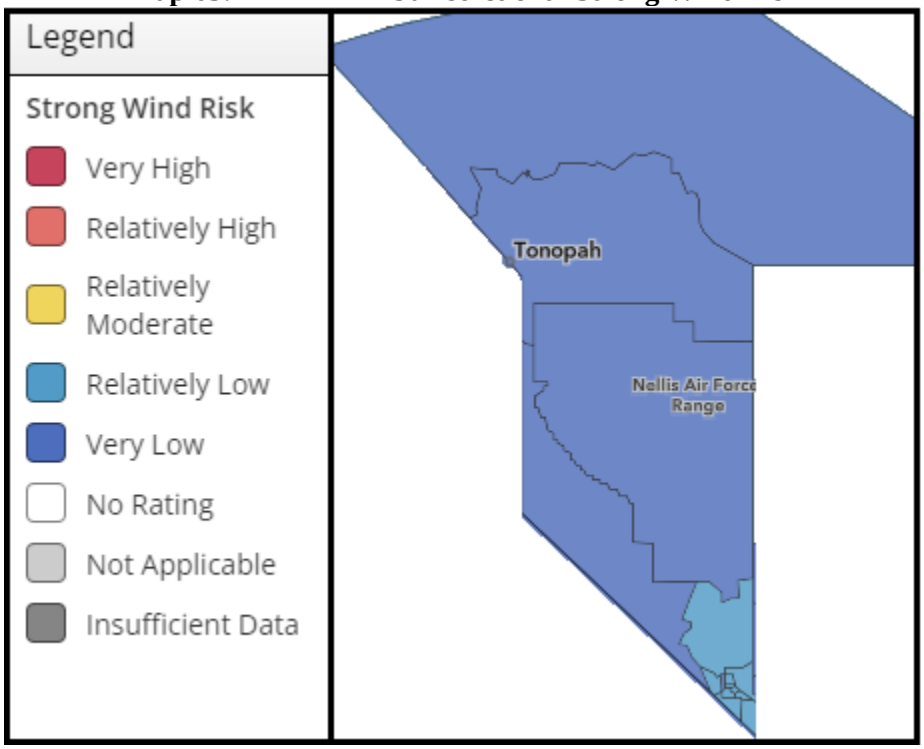
Source: FEMA NRI

Map 62: FEMA NRI Jurisdictional Lightning Risk



Source: FEMA NRI

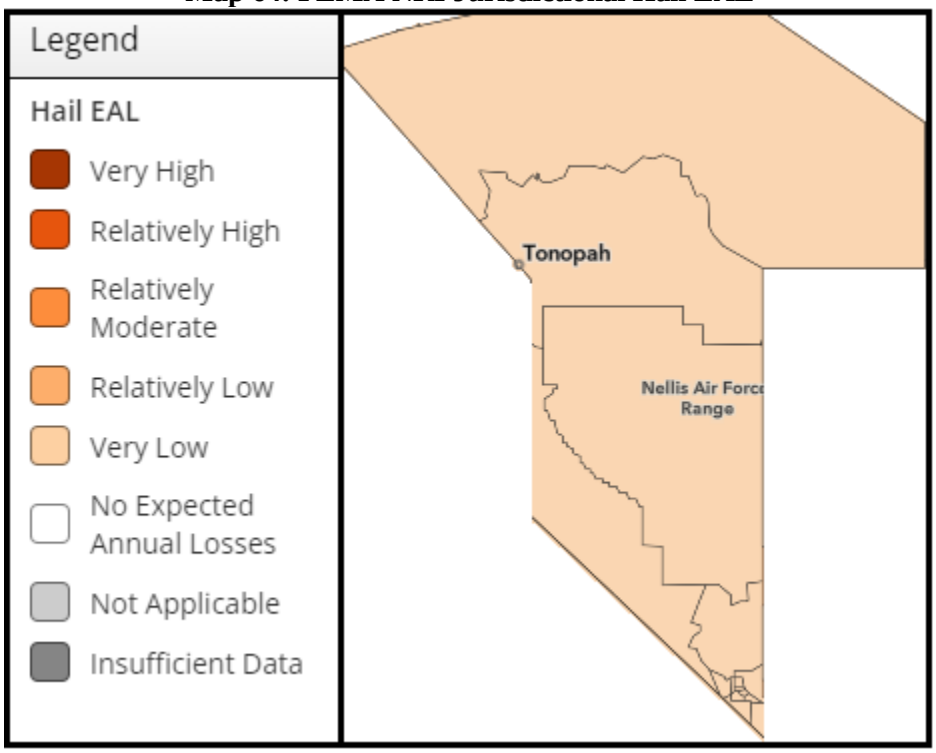
Map 63: FEMA NRI Jurisdictional Strong Wind Risk



Source: FEMA NRI

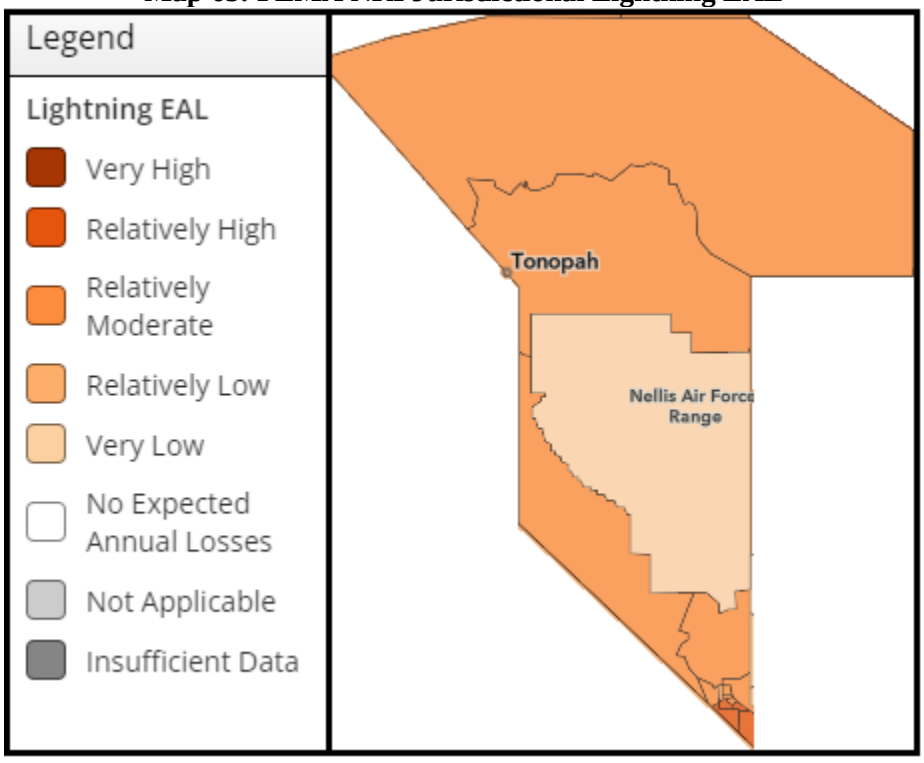
As part of the NRI, EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk. The following map indicates the EAL for from the components of severe thunderstorms for participating jurisdictions (as indicated by census tract) within Nye County:

Map 64: FEMA NRI Jurisdictional Hail EAL



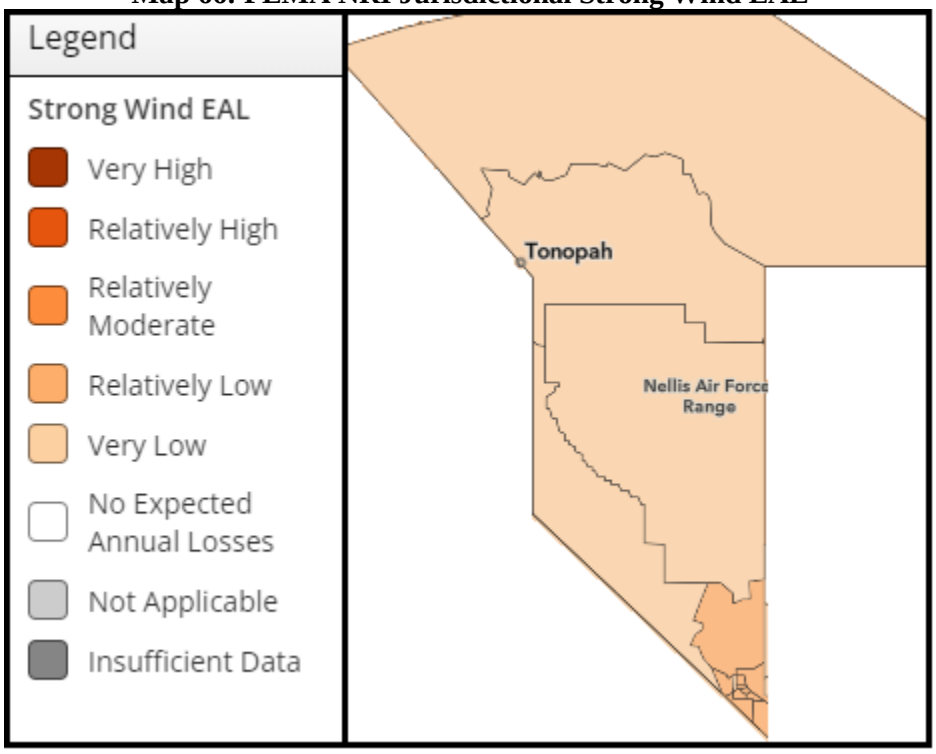
Source: FEMA NRI

Map 65: FEMA NRI Jurisdictional Lightning EAL



Source: FEMA NRI

Map 66: FEMA NRI Jurisdictional Strong Wind EAL



Source: FEMA NRI

The following tables indicate the FEMA NRI and EAL analysis for each participating jurisdiction for severe thunderstorm:

Table 75: Nye County FEMA NRI and EAL for Severe Thunderstorm by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Severe Thunderstorm NRI	Very Low	Relatively Low	Relatively Low	Relatively Low	Relatively Low
Severe Thunderstorm EAL	Very Low	Very Low	Very Low	Very Low	Very Low

Source: FEMA NRI

All jurisdictional and Duckwater Shoshone Nation citizens and structures are vulnerable to extreme temperature events. Using FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building valuation for each participating jurisdiction:

Table 76: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Population	Building Valuation
Amargosa Valley	480	$784,272,611
Duckwater Shoshone Tribe	219	$338,951,854
Pahrump	36,441	$7,423,893,881
Round Mountain	933	$338,951,854
Tonopah	2,179	$893,781,986

Source: FEMA NRI and U.S. Census Bureau

Potentially Vulnerable Community Lifelines

Severe thunderstorms can impact various community lifelines, critical systems and services that communities rely on for their functioning. Vulnerabilities arise due to the stress that thunderstorm conditions place on infrastructure, resources, and operational processes. As an overview, the May 2023 FEMA Benefit-Cost Analysis Sustainment and

Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 77: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Electrical Service	$199
Loss of Communications/Information Technology Services	$141

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

Severe thunderstorms can have significant impacts on electrical utilities, leading to disruptions in power supply and potential damage to infrastructure. Severe thunderstorms can affect electrical utilities in the following ways:

- Lightning Strikes: Lightning is a common occurrence in thunderstorms and poses a substantial risk to electrical infrastructure. Lightning strikes can damage power lines, transformers, substations, and other critical components, leading to power outages.
- Wind Damage: High winds associated with severe thunderstorms can cause trees, branches, and other debris to fall onto power lines. This can result in downed power lines, structural damage to utility poles, and disruptions in electrical service.
- Hailstorms: Severe thunderstorms may produce hail, which can damage power lines, transformers, and other equipment. Hailstones can also lead to short circuits and insulation damage on electrical components.
- Power Surges: Lightning strikes, strong winds, and other storm-related events can lead to power surges in the electrical grid. These surges can damage electronic devices, appliances, and utility equipment connected to the power supply.

Mapping concerning electrical generation plants and high-capacity transmission lines, may be found in Section 4.9.8.

Communications systems within Nye County may have an increased vulnerability to severe thunderstorm events. Of particular concern are 911 and dispatch systems. All jurisdictions are served by a 911 and dispatch system, providing direct dispatching for:

- Law Enforcement
- Emergency Medical Services
- Fire

Severe storms can disrupt this vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

- Physical Infrastructure Damage: High winds, heavy rainfall, and other severe weather conditions can cause physical damage to communication infrastructure such as cell towers, antennas, cables, and data centers. This damage can result in network outages and disruptions.
- Power Outages: Severe storms often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- Lightning Strikes: Lightning poses a threat to communication infrastructure. Direct strikes or induced surges can damage electronic equipment, leading to the need for repairs or replacements and causing downtime.
- Signal Interference: Severe storms can create electromagnetic interference that disrupts radio signals used in wireless communication. This interference can lead to poor signal quality, dropped calls, and slower data speeds.

- Loss of Backhaul Connectivity: Severe weather events can damage the backhaul infrastructure that connects various communication nodes. This backbone infrastructure is crucial for transmitting data between local and regional networks, and any disruption can impact overall network performance.
- Communication Tower Instability: High winds and extreme weather conditions can compromise the stability of communication towers. If towers are not designed to withstand severe weather, they may collapse, leading to network outages.
- Network Congestion: In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. The following data, from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency, indicates cost ranges for communications system components:

Table 78: Summary of Communication System Component Costs

Components	Examples	Cost	Expected Lifespan
Infrastructure	Towers, shelters, commercial and backup power equipment,	$$$–$$$$$	20–25 years
Fixed Station Equipment	Antennas, repeaters, towers on wheels, consoles, mobile stations, servers, computers, physical and electronic security elements (e.g., fencing, cameras, monitors, environmental conditions)	$$-$$$	3-15 years
Devices	Handheld portable radios, cellular phones, satellite phones, mobile data devices	$-$$	2-10 years
Accessories	Holsters, chargers, speakers, lapel microphone extensions, Bluetooth, vehicle kits, air cards, intercoms	$	2-10 years
Features	Encryption to protect against security risks, ruggedization to ensure reliant services, Over-the-Air-Programming, automatic roaming	$-$$$	-
Software and Data Storage	Global information system, emergency notifications, monitoring, call answering, database access, Automatic Vehicle Locator	$-$$	-

Source: U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency

Severe thunderstorms can have various impacts on emergency response efforts, affecting the ability of emergency services to effectively manage and address the consequences of the storm. Some potential impacts include:

- Increased Call Volume: Severe weather events typically result in a surge in emergency calls, overwhelming call centers and emergency hotlines. This can lead to delays in response times and increased stress on emergency services.
- Infrastructure Damage: High winds associated with severe thunderstorms can cause trees and power lines to fall, leading to road blockages and posing safety hazards. Infrastructure damage may slow down emergency response and increase the complexity of rescue operations.
- Search and Rescue Challenges: Storms can generate debris, making search and rescue operations more challenging. Flooded areas may hide hazards beneath the water surface, and strong winds can complicate helicopter or drone operations.
- Evacuations: Severe thunderstorms may necessitate evacuations, requiring emergency responders to manage shelters for displaced individuals. Providing adequate shelter, food, and medical care becomes a priority.

- Resource Allocation: Emergency response agencies must strategically allocate resources to address the most urgent needs during and after a severe thunderstorm. This includes deploying personnel, equipment, and supplies to the most affected areas.

The following represent fire services throughout Nye County:

- Beatty Fire Services (Volunteer)
- Belmont Fire Service (Volunteer)
- Currant/Duckwater Fire Service (Volunteer)
- Pahrump Fire Department, four stations (Paid)
- Manhattan Fire Service (Volunteer)
- Round Mountain/Smoky Valley Fire Service (Volunteer)
- Tonopah Fire Service (Volunteer)

The following represent emergency medical services throughout Nye County:

- Beatty, Station 31
- Smoky Valley, Station 21
- Tonopah, Station 11

Hospitals and other smaller medical facilities may see an increase in severe thunderstorm related injuries during an event, but it is considered unlikely that this increase will impact or overload capacity.

Severe thunderstorms can increase the demand for emergency shelters, particularly in cases of widespread power outages. Setting up and managing these shelters can strain resources.

Lower income communities, including communities with a large percentage of mobile homes, may suffer disproportionate impacts from severe storm events, especially strong winds. The following table indicates mobile home data for participating jurisdictions:

Table 79: Nye County Mobile Home Data

Jurisdiction	Number of Mobile Homes (2020)	Percentage Of Housing Stock as Mobile Homes (2020))
Nye County	8,035	31.9%
Amargosa Valley	371	78.0%
Beatty	224	40.3%
Duckwater	43	33.7%
Gabbs	103	74.4%
Pahrump	4,899	22.8%
Round Mountain	840	84.6%
Tonopah	151	12.6%

Source: United States Census Bureau

4.13 Wildfire

4.13.1 Hazard Description

The NWS defines a wildfire as any free burning uncontainable wildland fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment. They can occur naturally, by human accident, and on rare occasions by human action. Population de-concentration in the U.S. has resulted in rapid development in the outlying fringe of metropolitan areas and in rural areas with attractive recreational and aesthetic amenities, especially forests. This expansion has increased the likelihood that wildfires will threaten life and property.

According to the National Park Service there three classifications of wildfires:

- **Surface Fire:** Burning which may spread rapidly and ignites leaf litter, fallen branches and other fuels located at ground level.
- **Ground Fire:** Burning of organic matter in the soil beneath the surface.
- **Crown Fire:** Burning through the top layer (canopy) of trees. Crown fires, which can be very intense and difficult to contain, require strong winds, steep slopes, and large amounts of fuel to burn.

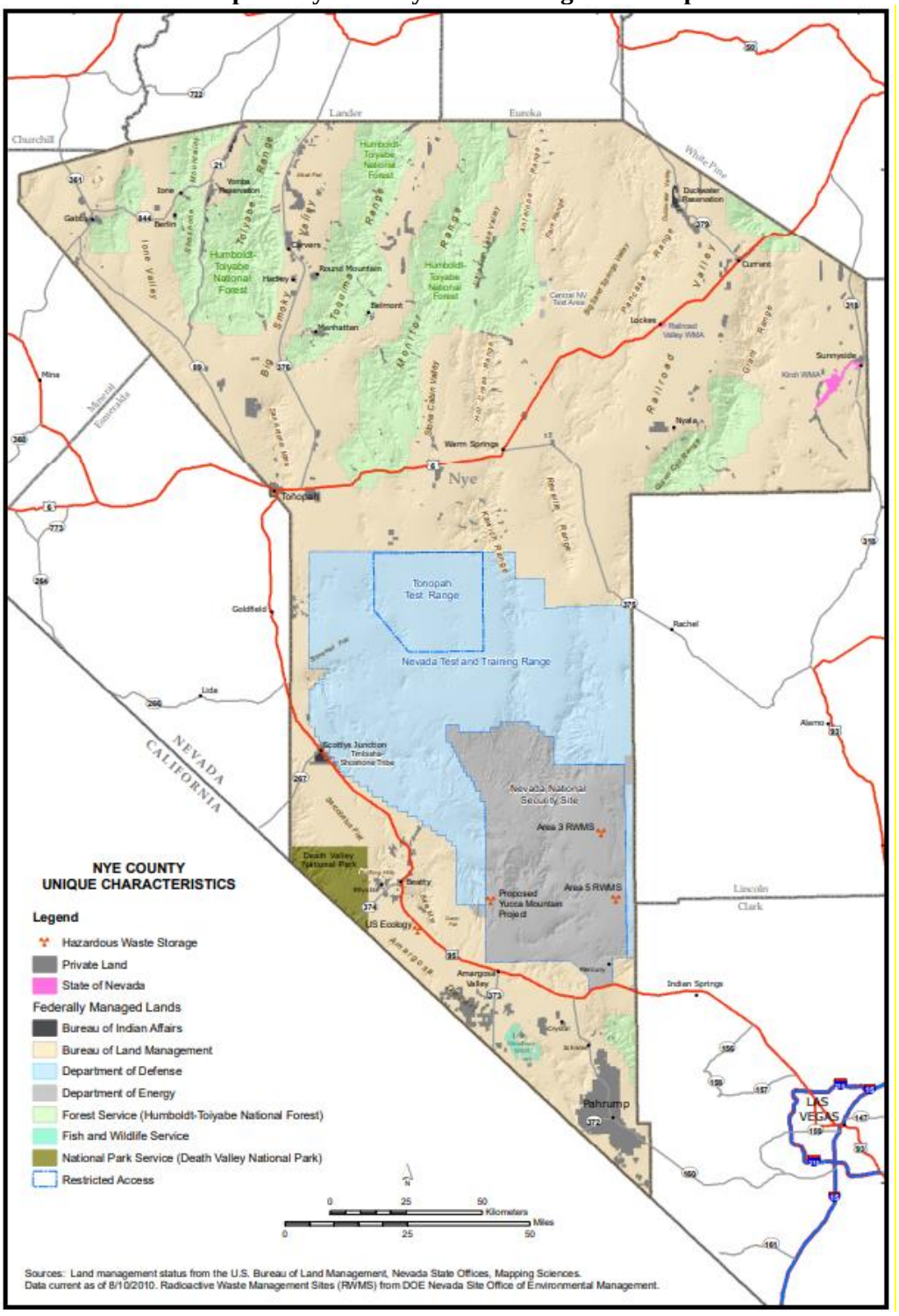
Wildfires are strongly influenced by multiple factors, including:

- **Weather:** Factors such as relative humidity, wind speed, ambient temperature and precipitation all influence the formation and growth of wildfires.
- **Topography:** Natural features, such as canyons or ridges, can increase the spread rate of a fire by funneling or drawing heated air and fire.
- **Fuel Type, Distribution and Moisture:** Available fuels, the spacing and density of available fuels, and fuel moisture content can determine spread rates and intensity of wildfires.
- **Drought Conditions:** Drought tends to increase both the likelihood and severity of wildfires.

4.12.2 – Location and Extent

Approximately 98% of land in Nye County is federally owned and not available for private or County use. The following map shows the land management status for Nye County.

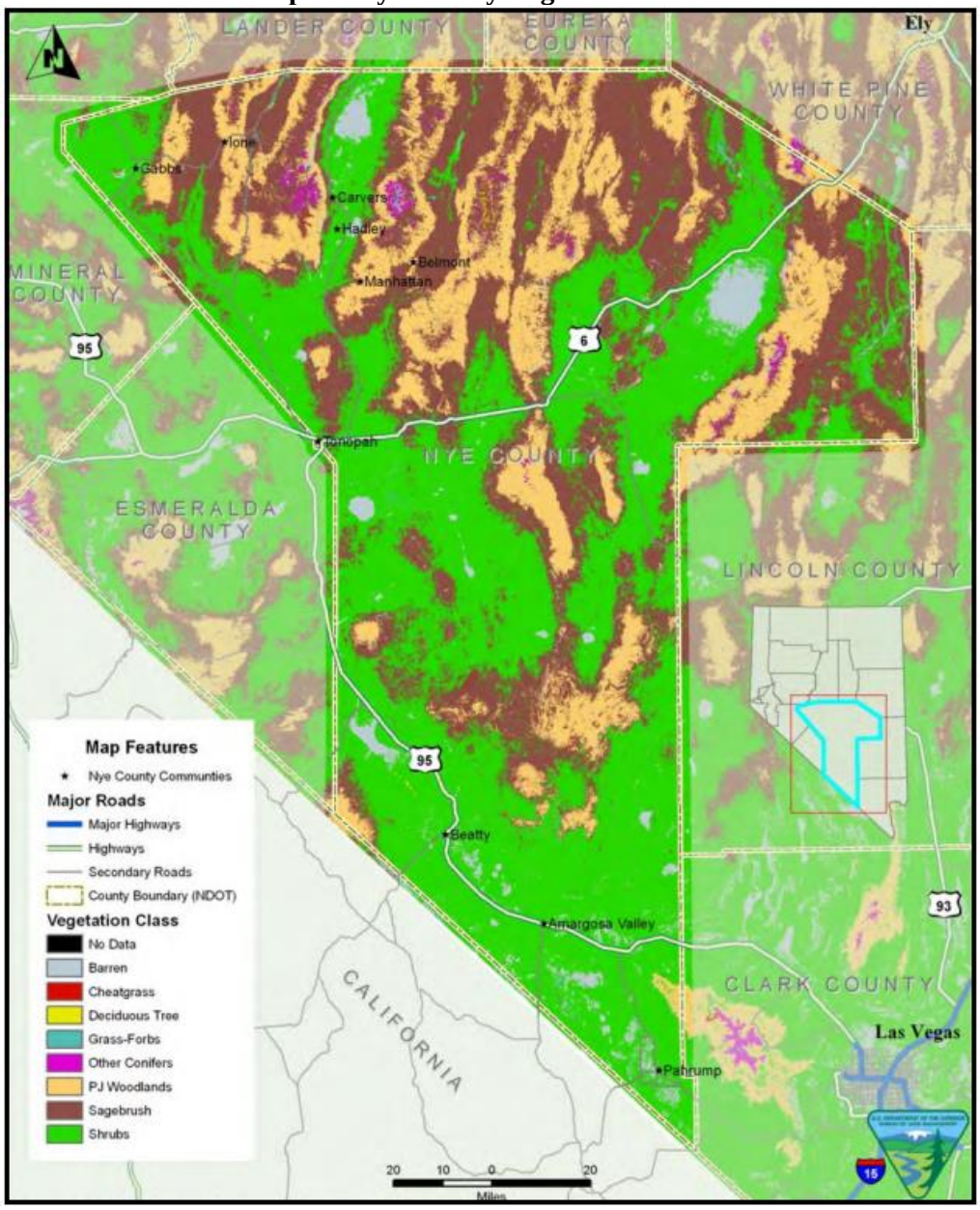
Map 67: Nye County Land Management Map



Source: Nye County

The following map, completed for the Nevada Fire Board, indicates vegetation classes throughout the county.

Map 68: Nye County Vegetation Classes



Source: Nye County and the Nevada Fire Board

The wildland/urban interface (WUI) is the area where human improvements such as homes, ranches and farms come in contact with the wildlands. The WUI creates an environment in which fire can move readily between structure and vegetation fuels, often resulting in massive fires, or conflagrations, that may lead to widespread evacuations. The expansion of the WUI in recent decades has significant implications for wildfire management and its impact. There are two types of WUI, intermixed and interface. Intermix WUI are areas where housing and vegetation intermingle, and interface WUI are areas with housing in the vicinity of dense, contiguous wildland vegetation.

According to the Nye County Fire Plan, the following are the WUI classifications for participating jurisdictions:

Table 80: Jurisdiction WUI Classification

Jurisdiction	WUI Classification
Amargosa Valley	Intermix
Beatty	Intermix
Duckwater Shoshone Tribal Reservation	Not rated
Gabbs	Interface/Intermix
Pahrump	Intermix
Round Mountain	Interface
Tonopah	Interface

Source: Nye County Fire Plan

The duration of a wildfire depends on the weather conditions, how dry it is, the availability of fuel to spread, and the ability of responders to contain and extinguish the fire. Historically, some wildfires have lasted only hours, while other fires have continued to spread and grow for an entire season. They spread quickly and often begin unnoticed until they have grown large enough to signal by dense smoke. If fuel is available, and the high wind speeds hit, a wildfire can spread over a large area in a very short amount of time. These factors make the difference between small upstart fires easily controlled by local fire services to fires destroying thousands of acres requiring multiple state and federal assets for containment and suppression.

The National Fire Danger Rating System allows fire managers to estimate today's or tomorrow's fire danger for a given area. It combines the effects of existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an area's fire protection needs. It links an organization's readiness level (or pre-planned fire suppression actions) to the potential fire problems of the day. The following is a brief explanation of the different fire danger levels based on criteria established by the National Fire Danger Rating System:

Table 81: National Fire Danger Rating System

Rating	Description
Low	Fuels do not ignite easily from small embers, but a more intense heat source, such as lightning, may start fires in duff or dry rotten wood. Fires in open, dry grasslands may burn easily a few hours after a rain, but most wood fires will spread slowly, creeping or smoldering. Control of fires is generally easy.
Moderate	Fires can start from most accidental causes, but the number of fire starts is usually pretty low. If a fire does start in an open, dry grassland, it will burn and spread quickly on windy days. Most wood fires will spread slowly to moderately. Average fire intensity will be moderate except in heavy concentrations of fuel, which may burn hot. Fires are still not likely to become serious and are often easy to control.
High	Fires can start easily from most causes and small fuels (such as grasses and needles) will ignite readily. Unattended campfires and brush fires are likely to escape. Fires will spread easily, with some areas of high intensity burning on slopes or concentrated fuels. Fires can become serious and difficult to control unless they are put out while they are still small.
Very High	Fires will start easily from most causes. The fires will spread rapidly and have a quick increase in intensity, right after ignition. Small fires can quickly become large fires and exhibit extreme fire intensity, such as long-distance spotting and fire whirls. These fires can be difficult to control and will often become much larger and longer-lasting fires.
Extreme	Fires of all types start quickly and burn intensely. All fires are potentially serious and can spread very quickly with intense burning. Small fires become big fires much faster than at the "very high" level. Spot fires are probable, with long-distance spotting likely. These fires are very difficult to fight and may become very dangerous and often last for several days.

Source: Wildfire Fire Assessment System

In order to see the current fire rating for Nye County, please visit the USGS at www.fs.usda.gov.

The severity of a wildfire depends on several quickly changing environmental factors. It is impossible to strategically estimate the severity of a wildfire as these factors, including drought conditions and wind speed, have such a great influence on the wildfire conditions. The Characteristic Fire Intensity Scale within the Southern Wildfire Risk Assessment Summary Report specially identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories.

The following table details the range of wildfire damages:

Table 82: Characteristic Fire Intensity Scale

Class	Description
Class 1- Very Low	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
Class 2- Low	Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
Class 3- Moderate	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
Class 4 - High	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property
Class 5- Very High	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Source: Southern Wildfire Risk Assessment Summary Report

Wildfires can occur anywhere in Nye County, including all jurisdictions and the entire Duckwater Shoshone Nation Tribal Reservation.

4.13.3 Previous Occurrences

The Nevada Wildfire Intelligence Bureau of Land Management, Nevada Fire and Aviation provides the following classification of fire size:

- Class A - one-fourth acre or less
- Class B - more than one-fourth acre, but less than 10 acres
- Class C - 10 acres or more, but less than 100 acres
- Class D - 100 acres or more, but less than 300 acres
- Class E - 300 acres or more, but less than 1,000 acres
- Class F - 1,000 acres or more, but less than 5,000 acres
- Class G - 5,000 acres or more

Using the above referenced fire size classification, the following table presents identified wildfire events and the resulting burned acreage in Nye County from the period 1980 – 2022:

Table 83: Nye County Wildfire Events, 1980 - 2022

Wildfire Class	Number of Events	Acres Burned
A	347	0
B	214	553
C	71	2,370
D	22	3,699
E	22	13,668

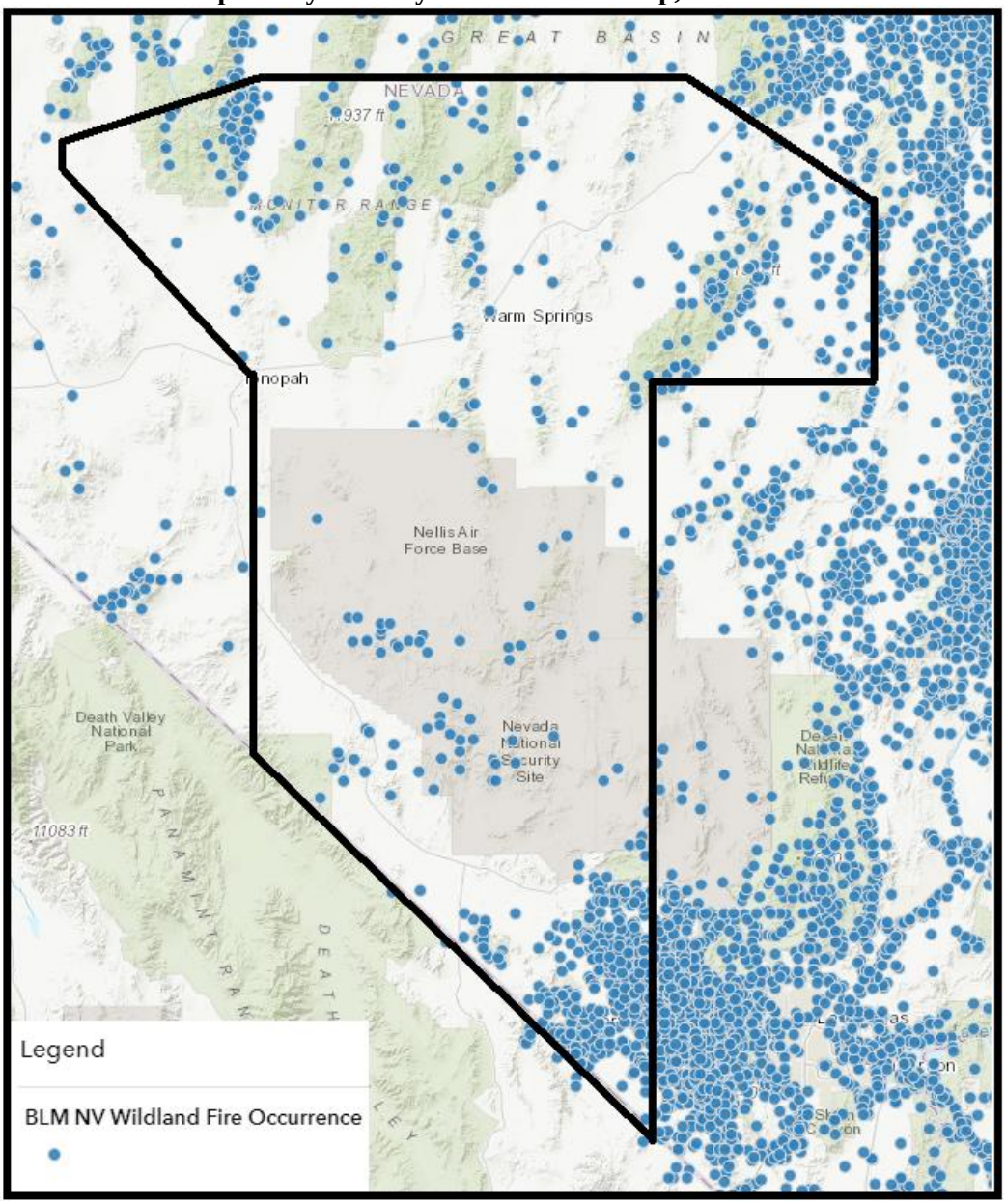
Table 83: Nye County Wildfire Events, 1980 - 2022

Wildfire Class	Number of Events	Acres Burned
F	19	47,403
G	14	164,408

Source: Nevada Wildfire Intelligence Bureau of Land Management, Nevada Fire and Aviation

In addition, the following map from the Bureau of Land Management (BLM) details historical wildfire occurrences in Nye County.

Map 69: Nye County BLM Wildfire Map, 1980 - 2022



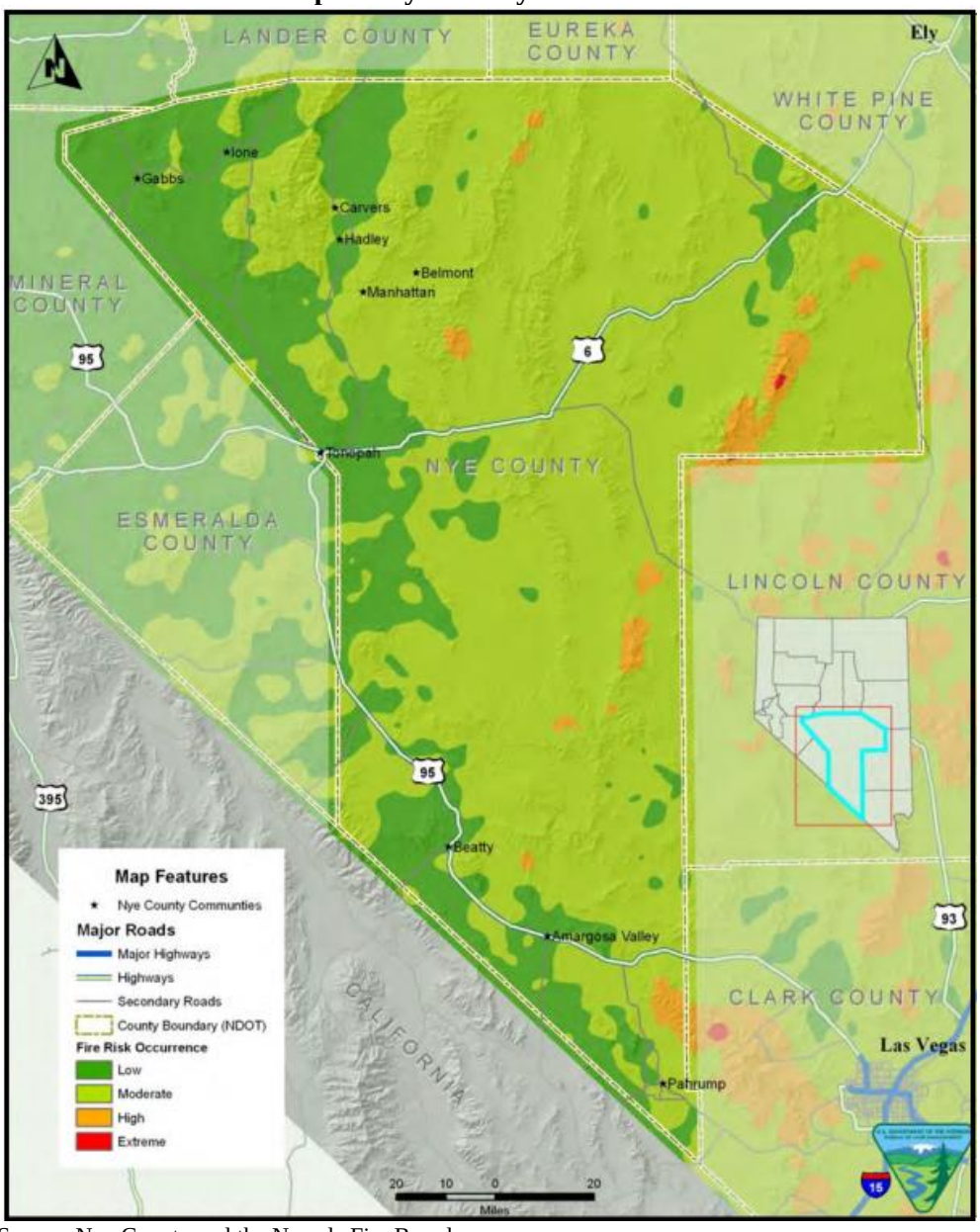
Source: BLM Nevada

As indicated by the mapping above, this hazard is regional in nature, and occurrences for participating jurisdictions and the entire Duckwater Shoshone Nation Reservation are not unique from Nye County as a whole.

4.13.4 Probability of Future Events

Predicting the probability of wildfire occurrences is tremendously challenging due to the large number of factors involved and the random nature of formation. Mapping conducted by the Nevada Fire Board in the Landscape-Scale Wildland Fire Risk/Hazard/Value Assessment of Nye County can be used to give an indication of potential wildfire risk for Nye County. As indicated by the following map, the risk of fire occurrence in Nye County is low to moderate. But it is important to note that while the risk may be low, the potential for these fires to become large is significant.

Map 70: Nye County Wildfire Risk



Source: Nye County and the Nevada Fire Board

The probability of a future occurrence of this hazard is identified in the above map and differs throughout Nye County. The following details the estimated future probability for wildfire for participating jurisdictions and the Duckwater Shoshone Nation:

- Amargosa Valley: Low
- Duckwater Shoshone Nation Reservation: Low to Moderate
- Pahrump: Low to Moderate

- Round Mountain: Moderate
- Tonopah: Low

4.13.5 Vulnerability and Impact

All participating jurisdictions are vulnerable to wildfires, and wildfires can impact a portion of, or the entire, planning area. As part of the Nye County Fire Plan, jurisdictional hazard ratings were determined using the following parameters:

- Community design
- Construction materials
- Defensible space
- Availability and capability of fire suppression resources
- Physical conditions such as fuel loading and topography

Based on these parameters, the following potential hazard ratings were determined:

Table 84: Wildfire Risk Assessment Rating

Hazard Class	Score
Low Hazard	<41
Moderate Hazard	41-60
High Hazard	61-75
Extreme Hazard	>76

Source: Nye County Fire Plan

The following table indicates the wildfire hazard rating for each participating jurisdiction:

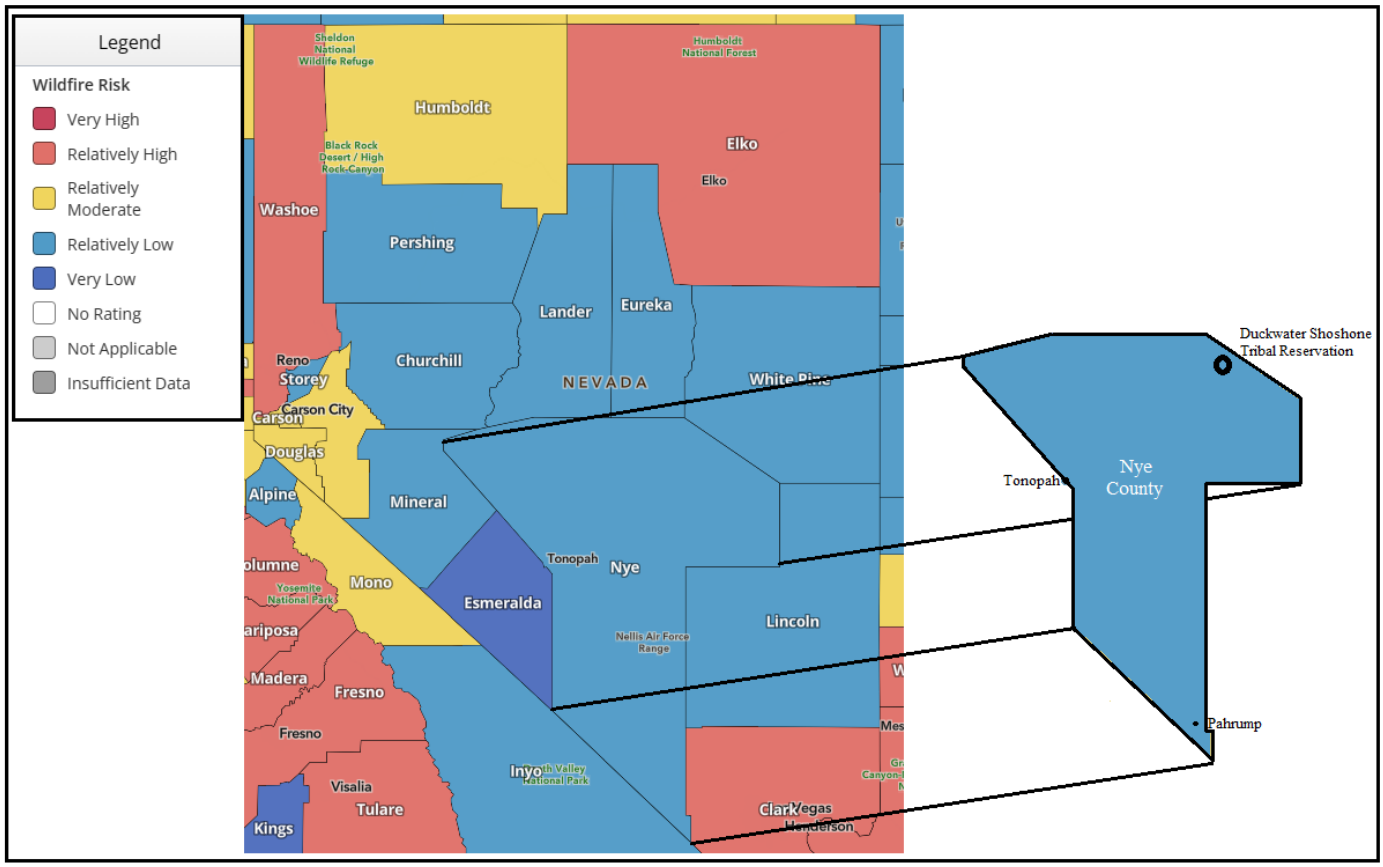
Table 85: Jurisdiction Wildfire Hazard Rating

Jurisdiction	Hazard Score	Hazard Rating
Amargosa Valley	54	Moderate
Beatty	59	Moderate
Duckwater Shoshone Tribal Reservation	No score	Not rated
Gabbs	46	Moderate
Pahrump	34	Low
Round Mountain	32	Low
Tonopah	37	Low

Source: Nye County Fire Plan

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map weas created indicating the potential risk to Nye County from wildfires:

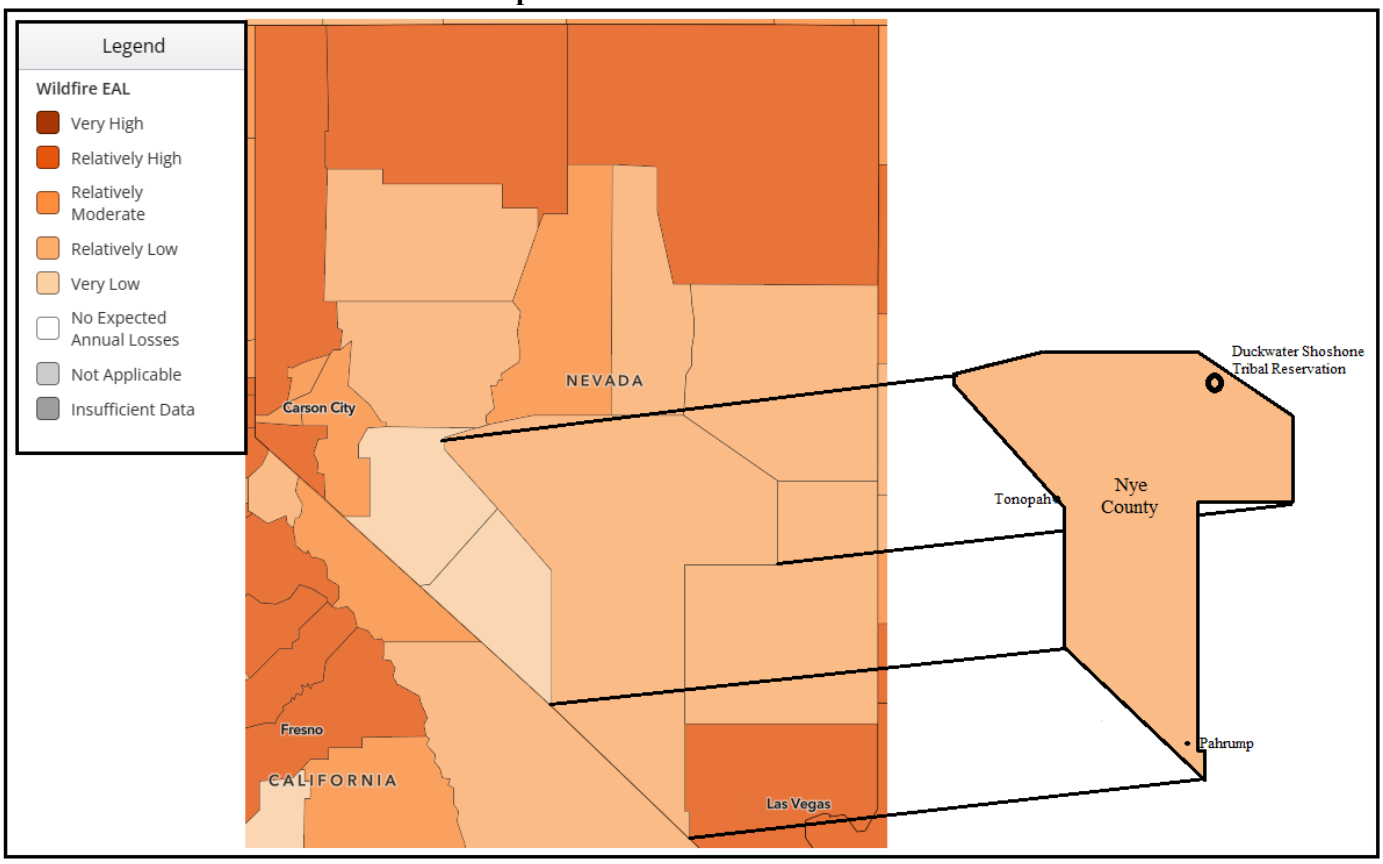
Map 71: FEMA NRI Wildfire Risk



Source: FEMA NRI

The following maps indicate the EAL for wildfires for Nye County:

Map 72: FEMA NRI Wildfire EAL



Source: FEMA NRI

4.13.6 Potential Impact of Climate Change

Climate change can result in a significant increase in the likelihood and severity of wildfires. The occurrence of more frequent and longer lasting droughts due to climate change can increase the availability of fuels for wildfires through the drying of vegetation. Additionally, both the increased occurrence and continued decline of native species due to lack of precipitation can cause the proliferation of invasive species such as cheatgrass and red, which can provide quick-burning fuels that contribute to the start and spread of fire.

The Nevada State Climate Initiative fact sheet provides specific details about how climate change has already and will continue to impact the state of Nevada. It highlights historical trends and future projections for some major climate variables and how they may affect public health, water resources, the environment, hospitality and agriculture. The following table details how climate change will most likely impact the citizens of Nye County in relation to wildfires:

Table 86: Potential Impact of Climate Change, Wildfires

Area of Impact	Historical Trends
Public Health	Increases in wildfire smoke decrease air quality, leading to increases in respiratory illness, hospitalizations and emergency room visits.
Water Resources	The risk of debris flows and erosion can increase after wildfire, leading to reduced water quality, changes in water supply, risks to public safety and economic losses.
Environment	Fire can lead to loss of native sagebrush and cheatgrass expansion, further increasing wildfire risk. Wildfire can increase erosion and sedimentation into watersheds, as well as negatively impacting wildlife
Recreation and Hospitality	Increased fire risk and smoke may lead to loss of tourism and recreation during fire season, as well as business closures and electricity shutoffs during extreme fire weather.

Table 86: Potential Impact of Climate Change, Wildfires

Area of Impact	Historical Trends
Agriculture and Ranching	Fire can cause direct infrastructure, livestock, forage and crop losses. Wildfire-induced changes in vegetation cover, including noxious weeds, can reduce forage production or quality. Federal grazing lands may be temporally or permanently closed due to fire. Wildfire smoke poses health hazards to those who work outdoors and can be harmful or fatal for livestock.

Source: Nevada Climate Initiative

4.13.7 Land Use and Development Trends

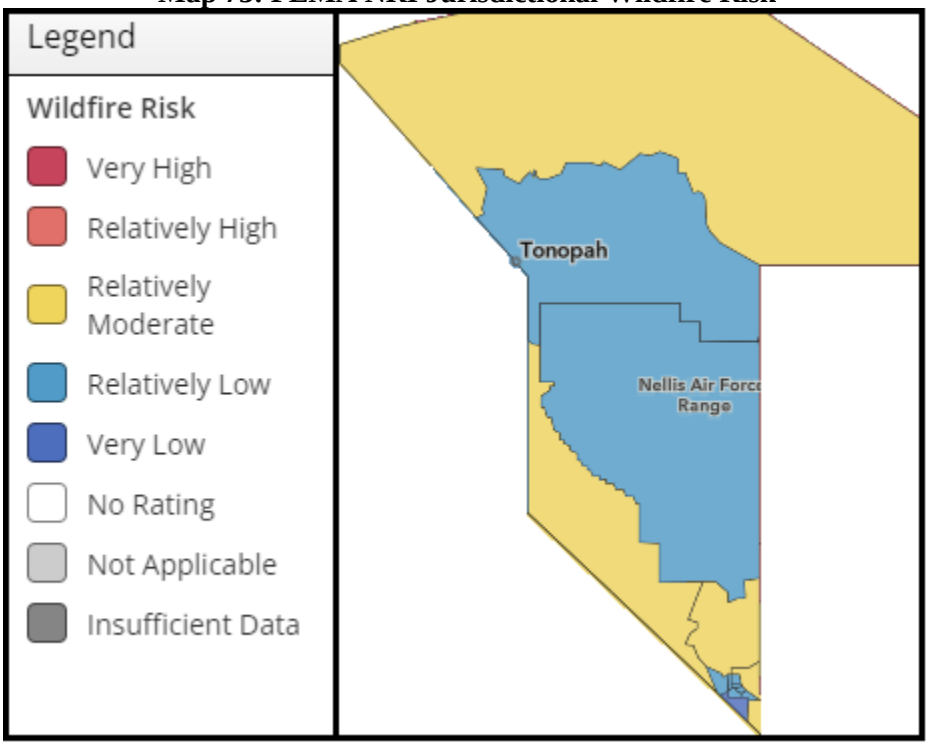
Increased residential growth increases a community's risk to wildfires by way of its facilities, population, and systems' vulnerabilities. None of the participating jurisdictions or the Duckwater Shoshone Nation have seen significant growth into identified hazard areas thus their risk to wildfires has not increased. Any buildings or infrastructure built in the future will have the same risk as other buildings or infrastructure built within the identified hazard areas.

4.13.8 Jurisdictional Risk and Vulnerability

To help understand the risk and vulnerability to wildfire conditions of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map was created indicating the potential risk to participating jurisdictions (as indicated by census tract) from wildfire:

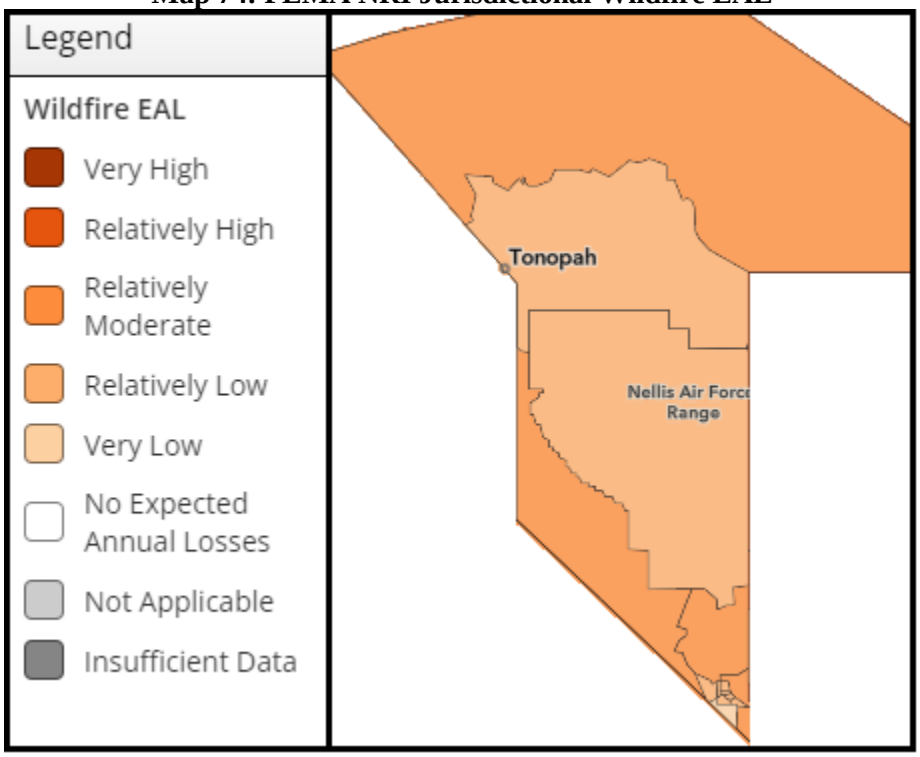
Map 73: FEMA NRI Jurisdictional Wildfire Risk



Source: FEMA NRI

As part of the NRI, EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk. The following map indicates the EAL for wildfire for participating jurisdictions (as indicated by census tract) within Nye County:

Map 74: FEMA NRI Jurisdictional Wildfire EAL



Source: FEMA NRI

The following table indicates the FEMA NRI and EAL analysis for each participating jurisdiction for wildfire:

Table 87: Nye County FEMA NRI and EAL for Wildfire by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Wildfire NRI	Relatively Low	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low
Wildfire EAL	Relatively Moderate	Relatively Moderate	Relatively Moderate	Relatively Low	Relatively Low

Source: FEMA NRI

All jurisdictional and Duckwater Shoshone Nation citizens and structures are vulnerable to wildfire events. Using FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building valuation for each participating jurisdiction:

Table 88: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Population	Building Valuation
Amargosa Valley	480	$784,272,611
Duckwater Shoshone Tribe	219	$338,951,854
Pahrump	36,441	$7,423,893,881
Round Mountain	933	$338,951,854
Tonopah	2,179	$893,781,986

Source: FEMA NRI and U.S. Census Bureau

Potentially Vulnerable Community Lifelines

Wildfires can impact various community lifelines, critical systems and services that communities rely on for their functioning. Vulnerabilities arise due to the stress that thunderstorm conditions place on infrastructure, resources, and operational processes. As an overview, the May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 89: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Electrical Service	$199
Loss of Wastewater Services	$66
Loss of Water Services	$138
Loss of Communications/Information Technology Services	$141

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

Wildfires can have significant impacts on electrical utilities, affecting both the infrastructure and the services they provide. Some of the key impacts include:

- Damage to Power Lines and Equipment: Wildfires can cause direct damage to electrical infrastructure such as power lines, transformers, substations, and other equipment. The intense heat from the fire can melt wires, damage insulators, and compromise the structural integrity of utility poles and towers.
- Power Outages: The destruction of power lines and equipment can lead to widespread power outages in affected areas. This not only disrupts daily life for residents but can also impact critical services such as hospitals, emergency response systems, and water treatment facilities.
- Infrastructure Accessibility: Wildfires can make it difficult for utility crews to access affected areas due to road closures, damaged infrastructure, and hazardous conditions. This can delay repair and restoration efforts, prolonging the duration of power outages.
- Grid Instability: The loss of transmission lines and substations can destabilize the electrical grid, leading to voltage fluctuations, frequency variations, and potential cascading outages. Restoring grid stability after a wildfire requires careful coordination and management by utility operators.
- Safety Concerns: Wildfires pose safety risks to utility workers involved in repair and restoration efforts. In addition to the immediate dangers of fire and smoke, there may be hazards such as downed power lines, weakened structures, and unstable terrain.

Mapping concerning electrical generation plants and high-capacity transmission lines may be found in Section 4.9.8.

Communications systems within Nye County may have an increased vulnerability to wildfire events. Of particular concern are 911 and dispatch systems. All jurisdictions are served by a 911 and dispatch system, providing direct dispatching for:

- Law Enforcement
- Emergency Medical Services
- Fire

Wildfires can disrupt this vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

- Structural Damage to Communication Towers: Wildfires can cause direct structural damage to communication towers, including cellular, television, radio, and microwave towers. Toppled or damaged towers can disrupt signal transmission and reception.

- Power Outages: Wildfires often cause power outages by damaging electrical infrastructure. Communication facilities, including cell towers and data centers, rely on a stable power supply. Power failures can lead to service interruptions.
- Fiber Optic Cable Damage: Wildfires can damage underground and aerial fiber optic cables. Severed cables can disrupt data transmission and internet connectivity.
- Equipment Damage: Communication equipment located outdoors, such as antennas, dishes, and amplifiers, can be damaged by wildfires, affecting the performance of communication systems.
- Loss of Communication Nodes: Wildfires can damage communication nodes, exchanges, and network switching centers. Loss of these critical components can lead to widespread service disruptions.
- Cellular Network Congestion: During and after a wildfire there is often an increased demand for cellular communication as individuals seek information and contact loved ones. This surge in demand can lead to network congestion and reduced service quality.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. The following data, from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency, indicates cost ranges for communications system components:

Table 90: Summary of Communication System Component Costs

Components	Examples	Cost	Expected Lifespan
Infrastructure	Towers, shelters, commercial and backup power equipment,	$$$–$$$$$	20–25 years
Fixed Station Equipment	Antennas, repeaters, towers on wheels, consoles, mobile stations, servers, computers, physical and electronic security elements (e.g., fencing, cameras, monitors, environmental conditions)	$$-$$$	3-15 years
Devices	Handheld portable radios, cellular phones, satellite phones, mobile data devices	$-$$	2-10 years
Accessories	Holsters, chargers, speakers, lapel microphone extensions, Bluetooth, vehicle kits, aircards, intercoms	$	2-10 years
Features	Encryption to protect against security risks, ruggedization to ensure reliant services, Over-the-Air-Programming, automatic roaming	$-$$$	-
Software and Data Storage	Global information system, emergency notifications, monitoring, call answering, database access, Automatic Vehicle Locator	$-$$	-

Source: U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency

Wildfires can significantly impact emergency response infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects. Wildfires can impact emergency response through:

- Transportation Disruptions: Debris on roads can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- Road Closures: Wildfires can lead to the closure of roads due to debris accumulation and hazardous conditions. This can limit access for emergency vehicles and impede the evacuation of residents.
- Communication Disruptions: Wildfires can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- Power Outages: Wildfires downing power lines can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.

- Resource Allocation Challenges: Wildfires often require the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- Logistical Challenges: Wildfires may create logistical challenges for the transportation of supplies, equipment, and personnel to affected areas, hindering the overall effectiveness of emergency response efforts.
- Increased Demand for Services: Wildfires can result in an increased demand for emergency services, including medical assistance, search and rescue operations, and responses to accidents. Emergency response organizations may need to manage a higher volume of incidents simultaneously.

Details concerning emergency response locations may be found in Section 4.13.8.

Wildfires can have various impacts on water utilities and infrastructure, affecting both the supply and quality of water as well as the infrastructure used to treat and distribute it. Here are some ways wildfires can impact water utilities and infrastructure:

- Water Source Contamination: Wildfires can contaminate surface water and groundwater sources with ash, debris, sediment, and pollutants. When rain falls on burned areas, it can wash ash and other contaminants into rivers, lakes, and reservoirs, compromising water quality. This can pose challenges for water treatment plants in removing contaminants and ensuring the safety of drinking water supplies.
- Reduced Water Availability: Wildfires can decrease water availability in affected watersheds by altering hydrological processes such as infiltration, runoff, and groundwater recharge. The loss of vegetation and soil cover increases the risk of erosion and reduces water retention capacity, leading to decreased streamflow and lower reservoir levels. Water utilities may need to implement conservation measures and adjust water allocation plans to manage shortages during and after wildfires.
- Infrastructure Damage: Wildfires can damage water infrastructure such as pipelines, pump stations, treatment plants, and storage facilities. Direct exposure to flames, intense heat, and falling debris can cause structural damage, melting of pipes, and electrical equipment failure. In addition, the loss of vegetation and soil stability can increase the risk of landslides and mudflows, which can damage or block water conveyance systems.
- Power Outages: As mentioned earlier, wildfires can disrupt electrical utilities, leading to power outages that affect water treatment and distribution operations. Many water treatment plants rely on electricity to power pumps, motors, and treatment processes. Without power, water utilities may be unable to maintain adequate water pressure, treat water to regulatory standards, or supply water to customers.

Details concerning water utilities may be found in Section 4.8.8.

Hospitals and other smaller medical facilities may see an increase in wildfire related injuries during an event, but it is considered unlikely that this increase will impact or overload capacity.

Jurisdictions seeing either an increase in population or an increase in occupied housing units may be at increased risk to wildfire events. The following represent participating jurisdictions that have seen an increase in either of those parameters:

- Nye County: Increase in occupied housing units and increase in population (largely in Pahrump)
- Round Mountain: Increase in occupied housing units

All other participating jurisdictions (Amargosa Valley, Duckwater Shoshone Tribe, and Tonopah) have seen either a static state or decrease in both population and occupied housing units.

At greater risk may be the vulnerable populations of each participating jurisdiction, including the especially young, the elderly, and those below the poverty level. Hazard occurrences can exacerbate existing vulnerabilities and create new

challenges. Vulnerable populations may have pre-existing health conditions that make them more susceptible to smoke inhalation, which can be exacerbated during wildfires. Limited financial capabilities can also increase their vulnerability as people on fixed incomes and with limited resources may face difficulties evacuating and finding temporary housing.

The following table details potentially vulnerable populations by participating jurisdictions:

Table 91: Nye County Potential at Risk Population Data

	Population 5 and Under (2020)	Population Over 65 (2020)	Speak a Language Other Than English (2020)	Estimated People in Poverty (2020)
Nye County	858 (1.7%)	7,515 (14.6%)	6,243 (12.1%)	8,048 (15.6%)
Amargosa Valley	115 (10.8%)	257 (24.2%)	455 (42.8%)	586 (55.1%)
Beatty	0 (0.0%)	248 (32.5%)	84 (11.0%)	162 (21.3%)
Gabbs	70 (37.6%)	45 24.2%)	0 (0.0%)	0 (0.0%)
Pahrump	1,906 (4.3%)	13,405 (30.0%)	5,100 (11.4%)	6,442 (14.4%)
Round Mountain	160 (17.1%)	126 (13.5%)	79 (8.5%)	108 (11.6%)
Tonopah	18 (0.8%)	745 (34.2%)	190 (8.7%)	418 (19.2%)
Duckwater Shoshone	30 (13.7%)	50 (22.8%)	60 (27.5%(	75 (34.2%)

Source: United States Census Bureau 2020

4.14 Winter Storm

4.14.1 Hazard Description

A winter storm encompasses multiple effects caused by winter weather. Included are strong winds, ice storms, heavy or prolonged snow, sleet, and extreme temperatures. Winter storms can be increasingly hazardous in areas and regions that only see winter storms intermittently.

This plan defines winter storms as a combination of the following winter weather effects as defined by NOAA and the NWS.

- **Ice Storm:** An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of ¼" or greater.
- **Heavy Snow:** This generally means snowfall accumulating to 4" or more in depth in 12 hours or less; or snowfall accumulating to 6" or more in depth in 24 hours or less.
- **Winter Storm:** Hazardous winter weather in the form of heavy snow, freezing rain, or heavy sleet. It may also include extremely low temperatures and increased wind.
- **Cold Wave/Extreme Cold:** As described by NWS, a cold wave is a rapid fall in temperature within a 24-hour period requiring substantially increased protection to agriculture, industry, commerce, and social activities. As evidenced by past incidents across the U.S., extreme cold can cause impact to human life and property.

4.14.2 – Location and Extent

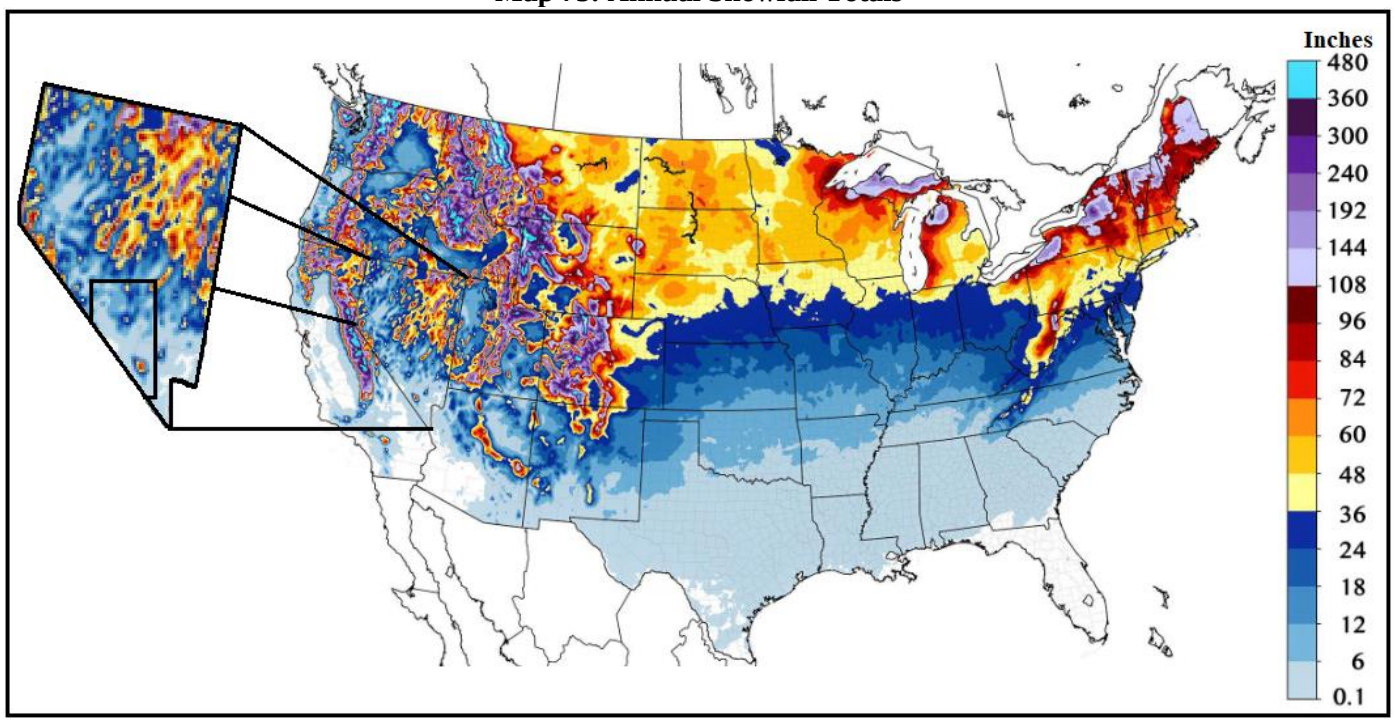
Due to the size and geographic diversity of Nye County annual snowfall amounts can vary significantly depending on the specific location within the county. In the lower, drier areas of Nye County, such as Pahrump and the Amargosa Valley, it is not uncommon to receive very little to no snowfall in a typical year. In contrast, some of the higher elevations and mountainous regions, including parts of the Toiyabe Range and the Toquima Range, can receive more significant snowfall.

Winter storms typically form with warning and are often anticipated. Like other large storm fronts, the severity of a storm is not as easily predicted and when it is, the window of notification is up to few hours to under an hour. Although meteorologists estimate the amount of snowfall a winter storm will drop, it is not known exactly how many feet of snow will fall, whether or not it will form an ice storm, or how powerful the winds will be until the storm is already affecting a community.

Winter storms can range from moderate snow over a few hours to blizzard conditions with high winds, freezing rain or sleet, heavy snowfall with blinding wind-driven snow and extremely cold temperatures that last several days.

The following map, from NOAA, indicates average annual snowfall totals for Nye County:

Map 75: Annual Snowfall Totals

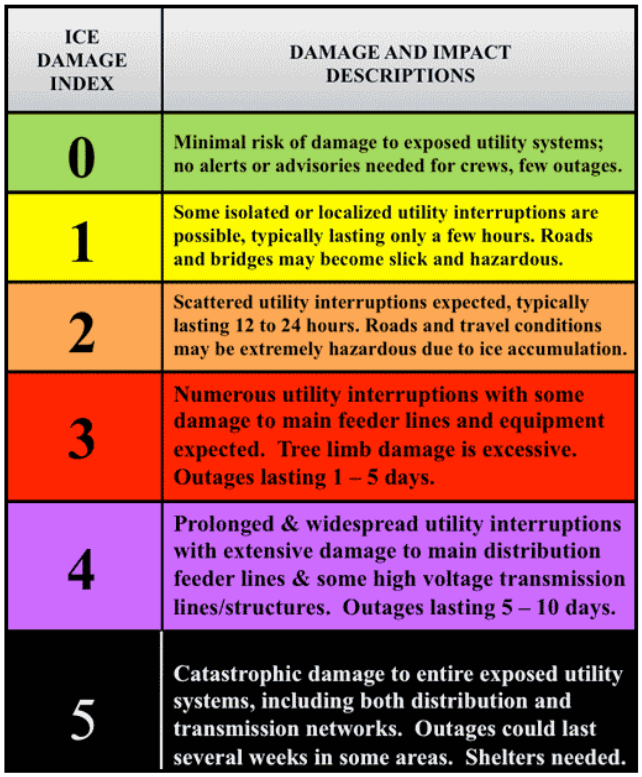


Source: NOAA

Ice storms are characterized by the accumulation of freezing rain or freezing drizzle, which coats surfaces with a layer of ice. These storms can have significant impacts on transportation, infrastructure, and the environment. Ice storms occur when there's a layer of warm air above a layer of cold air near the surface. Precipitation falls as rain in the warm layer and then freezes upon contact with surfaces at or below freezing temperatures in the cold layer. The most common type of precipitation during an ice storm is freezing rain. This is rain that falls as a liquid but freezes upon contact with cold surfaces, forming a layer of ice.

The Sperry–Piltz Ice Accumulation Index is an ice accumulation and ice damage prediction index that, when combined with NWS data, predicts the projected footprint, total ice accumulation, and resulting potential damage from approaching ice storms.

Figure 2: Sperry–Piltz Ice Accumulation Index



Source: Sperry–Piltz Ice Accumulation Index

Winter storms can occur anywhere in Nye County, including all jurisdictions and the entire Duckwater Shoshone Nation Tribal Reservation.

4.14.3 Previous Occurrence

The following table presents NCEI identified ice storm and winter storm events and the resulting damage totals in Nye County from 2003 to 2022, with the years 2003 and 2022 being full dataset years. Please note that as these storms events tend to cover larger areas occurrence data is being presented as representative of all participating jurisdictions.

Table 92: Nye County NCEI Winter Storm Events, 2003 - 2022

Event Type	Number of Events	Property Damage	Deaths	Injuries
Ice Storm	0	$0	0	0
Winter Storm/Blizzard	8	$0	1	6

Source: NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event oftentimes the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

The following provides both local accounts and NCEI descriptions of notable recorded events:

- **January 1, 2006 – Nye County:** During the early morning hours of January 3rd, icy roads contributed to three separate car crashes on Highways 95 and 6, resulting in one fatality (indirect) and six injuries.

This hazard is regional and generally widespread in nature, and occurrences for participating jurisdictions and the entire Duckwater Shoshone Nation Reservation are not unique from Nye County as a whole.

4.14.4 Probability of Future Events

Predicting the probability of winter storm occurrences is tremendously challenging due to the large number of factors involved and the random nature of formation. Data from the NCEI indicates that Nye County can expect on a yearly basis, relevant to winter storm events:

Table 93: Nye County Winter Storm Probability Summary

Data	Events
Number of Days with NCEI Reported Event (2003-2022)	8
Average Events per Year	<1

Source: NCEI

4.14.5 Vulnerability and Impact

Data from the NCEI indicates that Nye County can expect on a yearly basis, relevant to winter storm events:

Table 94: Nye County Winter Storm Impact Summary

Data	Recorded Impact
Deaths or Injuries (2003-2022)	7
Average Number of Deaths or Injuries	<1
Total Reported NCEI Property Damage (2003-2022)	$0
Average Property Damage per Year	$0

Source: NCEI

Winter storms have the ability to impact the entire planning area, but communities in the northern portion of the county and at higher elevation have a higher risk of winter storm occurrence. Unfortunately, there is no accurate method of predicting the location or extent of a winter storm. Additionally, it is not possible to predict any varying probability between the participating jurisdictions with the exception of varying risk as it is proportionate to a participating jurisdiction's demographics and the previously mentioned factors. Logically, participating jurisdictions with a greater population are at a higher risk as participating jurisdictions with a lower population are at a lower risk.

Lower income communities, or communities poorly served by power infrastructure may suffer disproportionate impacts. Especially at risk may be vulnerable populations of each participating jurisdiction, including the especially young, the elderly, and those below the poverty level.

Winter storms can have various impacts on the environment, particularly in regions prone to cold and snowy winters. These impacts can affect ecosystems, wildlife, and natural resources and can include habitat disruption, reduction of food sources, changes in migration patterns, and damage to foliage (especially if a spring storm). Additionally, the use of salt and de-icing chemicals on roads and sidewalks can have negative environmental impacts. These chemicals can find their way into nearby water bodies, leading to water pollution and harm to aquatic ecosystems. Snowmelt can also introduce pollutants from roadways and urban areas into rivers and streams, leading to reduced water quality. Elevated sediment levels and changes in water temperature can also affect aquatic life.

Severe winter weather can pose significant risks to county and local government operations and facilities. These risks can disrupt government functions, damage critical infrastructure, and strain resources. Some of the key risks to county and local government operations and facilities include:

- Transportation Disruptions: Snow and ice accumulation on roads and highways can hinder transportation, making it difficult for state agencies and personnel to travel and respond to emergencies. County and local

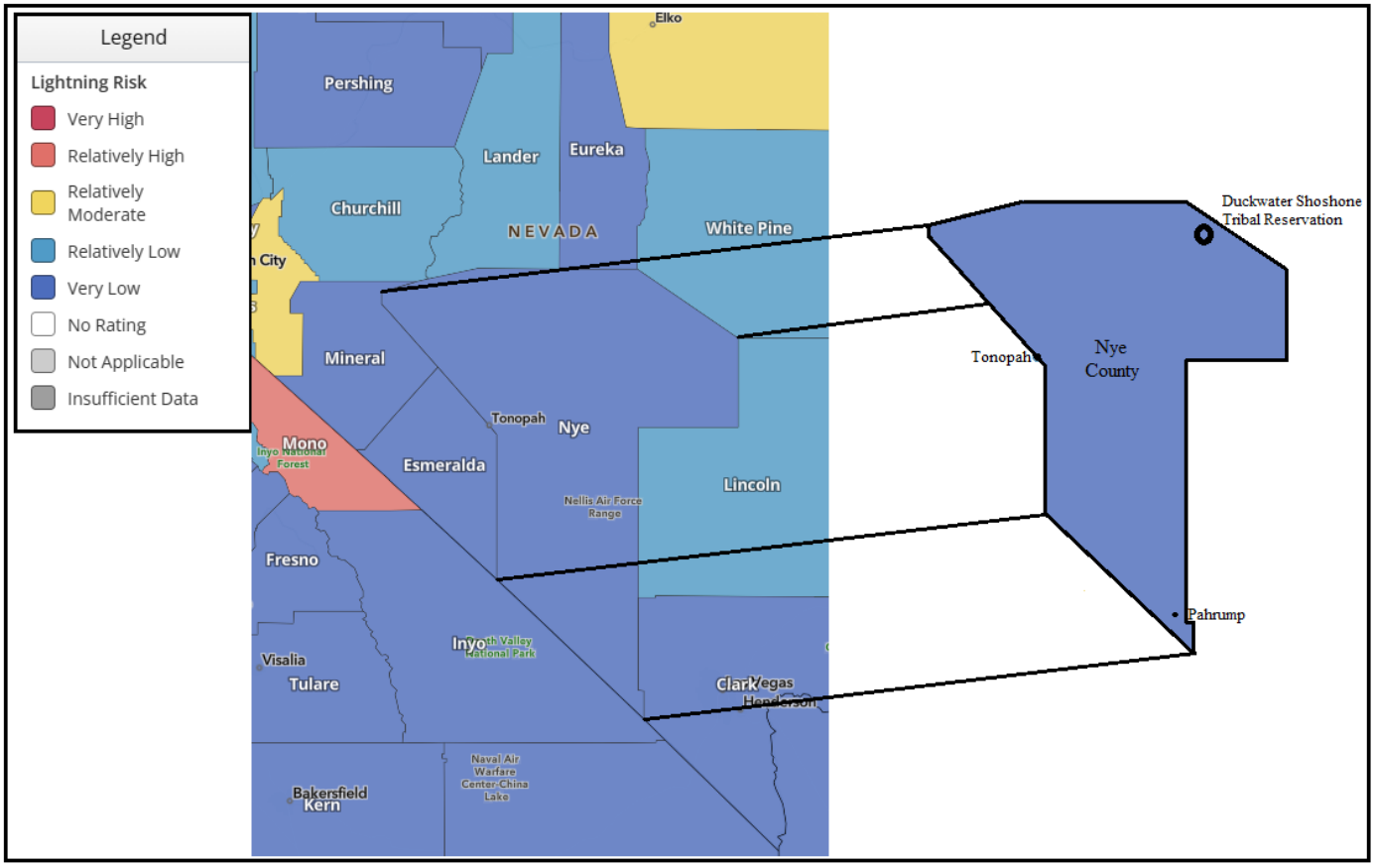
jurisdictions must allocate resources to plow and salt roads, clear snow and ice, and repair potholes caused by freezing and thawing. These efforts are costly and resource intensive.

- School Closures: Winter storms often lead to school closures, which can affect state-run education programs and services. State agencies may need to coordinate with school districts to ensure the safety of students.
- Emergency Response and Public Safety: Winter storms can result in increased demands for emergency services, including responses to traffic accidents, medical emergencies, and stranded motorists. County and local agencies must allocate additional resources to address these needs.
- Utilities and Power Outages: Severe winter storms can lead to power outages due to downed power lines, ice accumulation on power infrastructure, and transformer failures. County and local facilities, including emergency operation centers, may rely on backup power sources during outages.
- Healthcare System Strain: Hospitals and healthcare facilities may experience increased demand for medical services due to storm-related injuries and illnesses, including those related to slips and falls, traffic accidents, and cold exposure.
- Economic Impact: Winter storms can result in economic losses due to reduced economic activity, transportation disruptions, property damage, and increased spending on emergency response and recovery efforts.
- Emergency Shelter Operations: County agencies often operate or coordinate emergency shelters during winter storms to provide shelter and resources to vulnerable populations, including those experiencing homelessness.
- Resource Allocation: Governments must allocate resources, including personnel, equipment, and stockpiled supplies, to support emergency response efforts and maintain public services.
- Communication Challenges: Winter storms can disrupt communication networks, hindering the ability of state agencies to communicate internally and with the public. This can impact emergency notifications and coordination efforts.
- Budgetary Impact: The costs associated with snow removal, road maintenance, emergency response efforts, and infrastructure repair can strain budgets.
- Governance and Administrative Challenges: Government offices and facilities may experience closures or reduced staffing during severe winter weather, affecting administrative functions, regulatory processes, and public services.

A potentially large impact from winter storm events could be felt in the agricultural community. The USDA Risk Management Agency crop loss data relating to cold wet weather for the 32-year period of 1989 to 2021 allows us to quantify the monetary impact on the agricultural sector, Data indicates $1,352,968 in reported crop losses.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following maps were created indicating the potential risk to Nye County from winter weather:

Map 76: FEMA NRI Winter Weather Risk

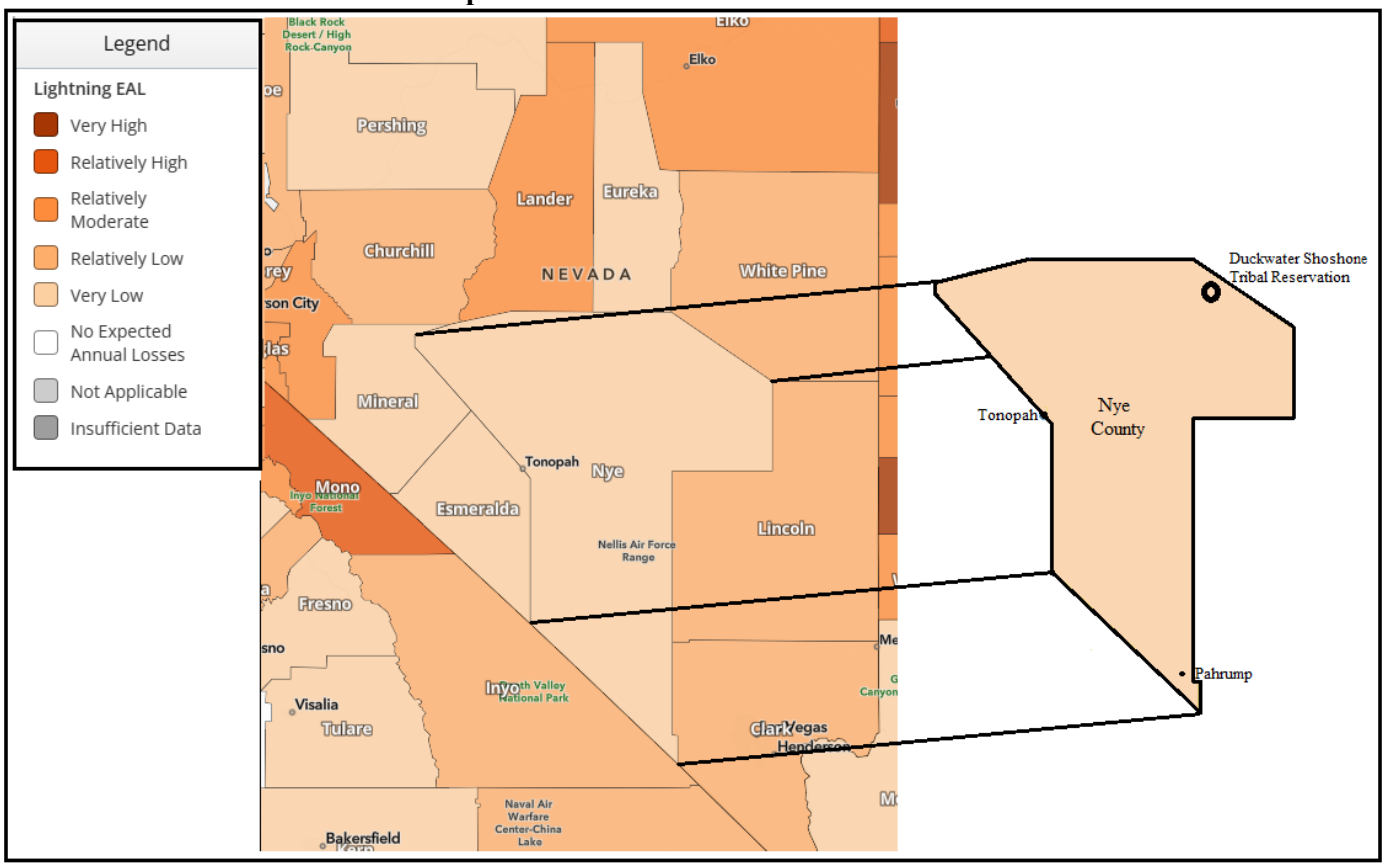


Source: FEMA NRI

As part of the NRI, EAL represents the average economic loss in dollars resulting from a hazard each year. It quantifies loss for relevant consequence types, buildings, people, and agriculture. An EAL score and rating represent a community's relative level of expected losses each year when compared to all other communities at the same level. EAL is calculated using an equation that includes exposure, annualized frequency, and historic loss ratio risk factors. Exposure is a factor that measures the building value, population, and agriculture value potentially exposed to a natural hazard occurrence. Annualized frequency is a factor that measures the expected frequency or probability of a hazard occurrence per year. Historic loss ratio is a factor that measures the percentage of the exposed consequence type value (building, population, or agriculture) expected to be lost due to an occurrence. EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community’s risk.

The following maps indicate the EAL for winter weather for Nye County:

Map 77: FEMA NRI Winter Weather EAL



Source: FEMA NRI

4.14.6 Climate Change

Climate change can lead to greater variability in precipitation patterns. In Nye County, this may result in more erratic and intense winter storms with periods of heavy snowfall followed by rain or freezing rain. These mixed precipitation events can make winter storms more challenging to predict and can lead to a greater risk of ice accumulation. Additionally, Nye County may experience milder winters as average temperatures rise due to climate change. While this could lead to a decrease in the frequency of traditional snowstorms, it may also increase the likelihood of winter storms that produce mixed precipitation, including freezing rain and sleet. Warmer temperatures can lead to a higher snowfall threshold, meaning that storms that would have produced snow in the past may now bring more rain or a mix of precipitation types. This can affect the accumulation of snow in the state. Changes in atmospheric circulation patterns associated with climate change can influence the tracks of winter storms. This could lead to a shift in the amounts of heavy snowfall, ice, and other winter weather hazards.

4.14.7 Land Use and Development Trends

Development trends speak to the potential impacts of land use and demographic changes in hazard prone areas. Data in this section is speculative, as future conditions are subject to numerous unpredictable factors.

As indicated in the data above, Nye County and all participating jurisdictions have been seeing generally static or declining populations. A static or declining population could decrease population risks to winter storms by nature of their being fewer citizens to negatively impact.

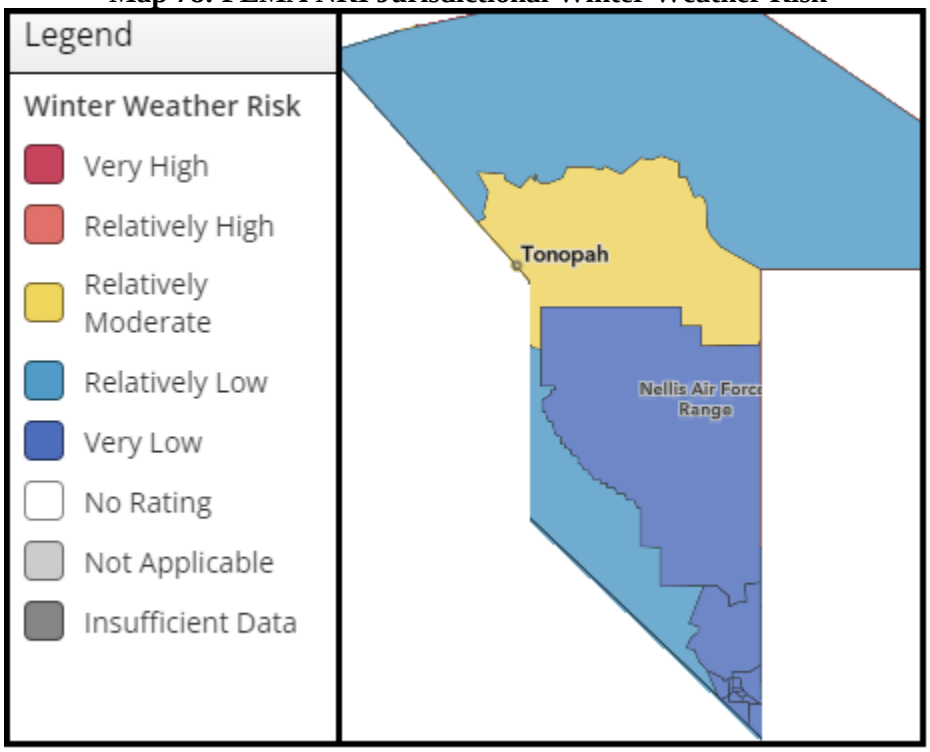
Nye County's current land-use regulations require the consideration of building codes during the development review process. A building-by-building structural review, including roof profile and strength would need to be to determine structural risk to snow and ice loads. However, enforced building codes can ensure that newly built and renovated structures can better withstand the loads.

4.14.8 Jurisdictional Risk and Vulnerability

To help understand the risk and vulnerability to winter weather conditions of participating jurisdictions mapping from the FEMA NRI was run on a census tract level. As the NRI does not generate mapping for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the following map was created indicating the potential risk to participating jurisdictions (as indicated by census tract) from winter weather:

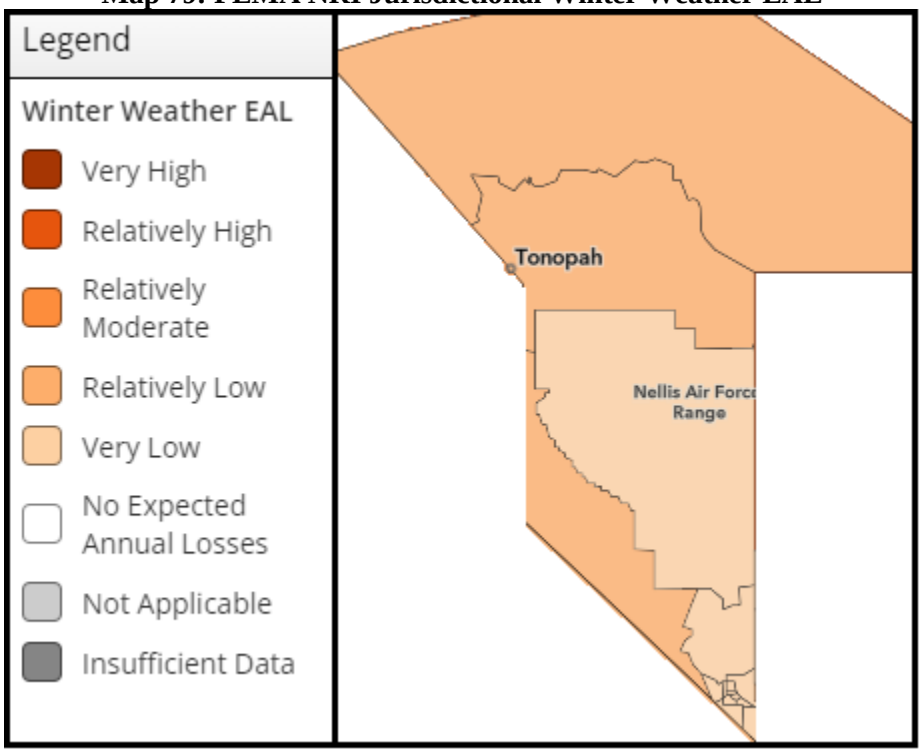
Map 78: FEMA NRI Jurisdictional Winter Weather Risk



Source: FEMA NRI

As part of the NRI, EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk. The following map indicates the EAL for winter weather for participating jurisdictions (as indicated by census tract) within Nye County:

Map 79: FEMA NRI Jurisdictional Winter Weather EAL



Source: FEMA NRI

The following table indicates the FEMA NRI and EAL analysis for each participating jurisdiction for winter weather:

Table 95: Nye County FEMA NRI and EAL for Winter Weather by Jurisdiction

Hazard	Jurisdiction				
	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Winter Weather NRI	Very Low	Relatively Low	Relatively Low	Relatively Moderate	Relatively Moderate
Winter Weather EAL	Very Low	Very Low	Very Low	Very Low	Very Low

Source: FEMA NRI

All jurisdictional and Duckwater Shoshone Nation citizens and structures are vulnerable to extreme temperature events. Using FEMA NRI census tract data, along with U.S. Census data, the following table represents the population and building valuation for each participating jurisdiction:

Table 96: Nye County Identified Population and Valuation by Jurisdiction

Jurisdiction	Population	Building Valuation
Amargosa Valley	480	$784,272,611
Duckwater Shoshone Tribe	219	$338,951,854
Pahrump	36,441	$7,423,893,881
Round Mountain	933	$338,951,854
Tonopah	2,179	$893,781,986

Source: FEMA NRI and U.S. Census Bureau

Potentially Vulnerable Community Lifelines

Extreme cold temperatures often associated with winter weather can impact various community lifelines, critical systems, and services that communities rely on for their functioning. Vulnerabilities arise due to the stress that winter weather places on infrastructure, resources, and operational processes. As an overview, the May 2023 FEMA Benefit-

Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 97: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Electrical Service	$199
Loss of Wastewater Services	$66
Loss of Water Services	$138
Loss of Communications/Information Technology Services	$141

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

Winter storms can have significant impacts on road infrastructure, creating challenging conditions for transportation and necessitating proactive measures for maintenance and safety. Winter storms can impact road infrastructure:

- Snow Accumulation: Snowfall can accumulate on road surfaces, creating slippery and hazardous conditions for drivers. Accumulated snow can reduce road visibility and make travel difficult.
- Ice Formation: Freezing temperatures can lead to the formation of ice on roadways, increasing the risk of accidents and making roads slippery. Black ice, which is nearly invisible, poses a particular hazard.
- Snowdrifts: Strong winds during winter storms can lead to the formation of snowdrifts on roads, especially in open areas. These drifts can obstruct visibility and impede traffic flow.
- Road Surface Damage: The freeze-thaw cycle, where melted snow refreezes, can lead to the formation of ice patches and potholes on road surfaces. This cycle can contribute to the deterioration of road infrastructure over time.
- Freeze-Thaw Cycling: Alternating freezing and thawing can cause the expansion and contraction of water within pavement cracks, leading to the formation and enlargement of potholes.
- Snowplow and Deicing Operations: Snowplows and deicing operations are necessary to clear roads and improve driving conditions. However, the use of salt and chemicals for deicing can contribute to corrosion and deterioration of road surfaces and infrastructure.
- Infrastructure Stress: Bridges and overpasses are particularly susceptible to ice formation due to the lack of ground contact. Winter storms can stress these structures, potentially leading to structural issues over time.

In counties with fewer resources and equipment, the cost for snow roadway snow operations can range from a few thousand dollars to around $100,000 per snow event.

In general, the priority for snow removal is based on traffic volume, speed limits and road surface types. Preference is generally given in the following order:

- State trunklines
- Primary roads
- Major local roads
- Residential / subdivision streets

Winter storms can impact electrical utilities in various ways, potentially leading to disruptions in service. These impacts include:

- Power Outages: High temperatures can strain electrical systems, leading to increased demand for cooling systems like air conditioners. This heightened demand can overload power grids, resulting in power outages.
- Equipment Failure: Electrical equipment, such as cables and switches, may experience higher resistance and increased stress during extreme heat, increasing the likelihood of equipment failures.

- Reduced Efficiency in Power Plants: Power generation facilities may experience reduced efficiency during heatwaves due to elevated ambient temperatures. This can affect the output of power plants and potentially lead to supply shortages.
- Icing on Power Lines: Ice accumulation on power lines can lead to increased weight, potentially causing lines to sag or break. This can result in power outages and safety hazards.

Mapping concerning high-capacity transmission lines and electrical generating locations is provided in Section 4.9.8.

Winter storms can significantly impact emergency response infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of severe weather events. Winter storms can impact emergency response through:

- Transportation Disruptions: Snow and ice accumulation on roads can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- Road Closures: Winter storms can lead to the closure of roads due to snow accumulation, ice, and hazardous conditions. This can limit access for emergency vehicles and impede the evacuation of residents.
- Communication Disruptions: Snow and ice can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- Power Outages: Severe winter weather, including ice storms, can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.
- Exposure: Emergency responders face increased health and safety risks in winter conditions. Exposure to extreme cold, snow, and ice can impact the well-being of responders and affect their ability to provide effective assistance.
- Resource Allocation Challenges: Winter storms often require the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- Logistical Challenges: Snow accumulation and icy conditions may create logistical challenges for the transportation of supplies, equipment, and personnel to affected areas, hindering the overall effectiveness of emergency response efforts.
- Increased Demand for Services: Winter storms can result in an increased demand for emergency services, including medical assistance, search and rescue operations, and responses to accidents. Emergency response organizations may need to manage a higher volume of incidents simultaneously.

Mapping concerning road infrastructure is provided in Section 4.10.8.

Hospitals and other smaller medical facilities may see an increase in winter storm related injuries during an event, but it is considered unlikely that this increase will impact or overload capacity.

Winter storms can increase the demand for emergency shelters, particularly in cases of widespread power outages. Setting up and managing these shelters can strain resources.

At greater risk may be the vulnerable populations of each participating jurisdiction, including the especially young, the elderly, and those below the poverty level. Vulnerable populations may have health conditions that make them more susceptible to cold, increasing the risk of illnesses. Limited financial capabilities can make providing home heating. A challenge. The following table details potentially vulnerable populations by participating jurisdictions:

Table 98: Nye County Potential at Risk Population Data

Jurisdiction	Population 5 and Under (2020)	Population Over 65 (2020)	Language Barrier (2020)	People in Poverty (2020)
Nye County	858 (1.7%)	7,515 (14.6%)	6,243 (12.1%)	8,048 (15.6%)
Amargosa Valley	115 (10.8%)	257 (24.2%)	455 (42.8%)	586 (55.1%)
Beatty	0 (0.0%)	248 (32.5%)	84 (11.0%)	162 (21.3%)
Gabbs	70 (37.6%)	45 24.2%)	0 (0.0%)	0 (0.0%)
Pahrump	1,906 (4.3%)	13,405 (30.0%)	5,100 (11.4%)	6,442 (14.4%)
Round Mountain	160 (17.1%)	126 (13.5%)	79 (8.5%)	108 (11.6%)
Tonopah	18 (0.8%)	745 (34.2%)	190 (8.7%)	418 (19.2%)
Duckwater Shoshone	30 (13.7%)	50 (22.8%)	60 (27.5%(	75 (34.2%)

Source: United States Census Bureau 2020

Section 5 –Capability Assessment

5.1 Introduction

This capability overview for Nye County documents programs, policies, and funding mechanisms for participating jurisdictions. All listed capabilities documented in the previous HMP were reviewed for relevance and updated to reflect the current environment, as necessary. Additionally, any programs, policies, or funding mechanisms that are no longer applicable, are outdated, or are no longer in existence have been removed. As part of this process, updated jurisdictional capability profiles were sent for review and, if necessary, further revision.

This section of the plan discusses the current capacity of participating jurisdictions to mitigate the effects of identified hazards. A capability assessment is conducted to determine the ability of a jurisdiction to execute a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

A capability assessment helps to determine which mitigation actions are practical based on a jurisdiction's fiscal, staffing and political resources, and consists of:

- An inventory of relevant plans, ordinances, or programs already in place
- An analysis capacity to carry them out.

A thoughtful review of jurisdictional capabilities will assist in determining gaps that could limit current or proposed mitigation activities, or potentially aggravate a jurisdiction's vulnerability to an identified hazard. Additionally, a capability assessment can detail current successful mitigation actions that should continue to receive support.

Nye County and its participating jurisdictions' governments utilize a single emergency management agency for their services, NCOEM. Local initiatives, programs, and policies are often facilitated by the NCOEM in coordination with local governments, and other emergency related entities, as it is the sole, primary agency responsible for emergency management. NCOEM does this by fostering local partnerships and relationships, an active Local Emergency Planning Committee (LEPC), and assisting local governments with funding and training initiatives. The Duckwater Shoshone Nation operates an Emergency Management department that works collectively with Nye County on all issues and response efforts.

While all jurisdictions have the capability needed to participate in the mitigation planning process, all rely on the technical expertise of NCOEM and the Nevada Division of Emergency Management / Homeland Security to apply for mitigation grant funding and oversee mitigation projects. Additionally, further augmenting local emergency management capabilities, the Nevada Division of Emergency Management aids with state and federal mitigation and emergency management initiatives and available funding opportunities.

Technical capabilities for each jurisdiction vary widely and are generally based on financial capabilities. In general, larger jurisdictions have a greater range of technical capabilities and staffing related to planning, engineering, and mapping, while smaller jurisdictions lack these capabilities. It should be noted that the Nevada Division of Emergency Management offers a variety of programs to provide local jurisdictions with technical expertise, including mapping and planning.

The following table details local and Tribal departments and positions and their roles in supporting hazard mitigation planning, implementation, and post-disaster recovery:

Table 99: Departments/Positions Supporting Mitigation Planning, Implementation, and Post-Disaster Recovery

Department or Position	Description	Role in Mitigation
Building Officials	Implements and enforces building codes and zoning ordinances.	Ensures construction standards are consistently applied.
Emergency Manager and Emergency Management Team	Directs local response, recovery, and mitigation programs.	Develops Emergency Operations Plan, Continuity Plans, and Hazard Mitigation Plans, helping to minimize loss of life and property damage.
NFIP Coordinator	Oversees compliance with the NFIP and addresses flood determinations, mapping issues, and construction standards within Special Flood Hazard Areas.	Reviews floodplain/building permits for structures within floodplains and inspects developments to determine compliance with the community development standards and NFIP requirements. Explains floodplain development requirements to community leaders, citizens, and the general public.
Public Works Departments	Responsible for drainage and storm water management systems, and road maintenance. Responsible for debris clearance and reconstruction after event.	Provides for the ongoing maintenance and upgrading of local storm water systems to help reduce flood risks. Provides for the maintenance and improvement of roadway systems to help mitigate against future hazard occurrences.
Town/City/Tribal Council	Approves subdivision, zoning and land ordinances and bylaws and facilitates capital improvements budget and plan.	Provide leadership and approval for local hazard mitigation plans, projects, grants, and programs.

5.2 Regulation of Development

The regulation of development plays a crucial role in helping a community become more resilient in the face of various hazards. Effective regulation of development contributes to community resilience through:

- Risk Reduction: Regulations guide land use and construction practices, ensuring that they provide strong protection against hazards.
- Public Safety: Building codes and land-use regulations establish minimum safety standards for construction, including structural integrity, fire resistance, and the use of resilient materials.
- Infrastructure Resilience: Regulations may require infrastructure improvements, such as the construction of resilient roads, bridges, utility systems, and drainage systems. This strengthens a community's ability to withstand hazards, ensures the continued operation of critical services, and aids in recovery.
- Floodplain Management: Regulations in flood-prone areas can mandate elevation requirements for new construction, ensuring that structures are built above the base flood elevation. This minimizes flood damage, reduces the need for costly post-disaster repairs, and protects property values.
- Land Use Planning: Effective land-use planning helps communities avoid inappropriate development in areas at high risk of hazards.
- Community Awareness: Public education and outreach can be incorporated into regulations, requiring communities to inform residents about local hazards, evacuation routes, and preparedness. Informed residents are more likely to take protective measures and respond effectively to disasters.

The following sections provide further detail on building codes, zoning ordinances, and floodplain management.

Building Codes

Building codes establish general minimum construction standards and are enforced through authorized local building inspection agencies and inspectors. Building codes provide for:

- Life Safety: Building codes include provisions for fire safety, emergency egress, and the use of fire-resistant materials.
- Accessibility and Life Support: Building codes incorporate accessibility standards, ensuring that buildings are designed to accommodate all individuals. This is crucial during and after disasters when people with mobility issues may require assistance. Accessible features also benefit emergency responders and support recovery efforts.
- Retrofitting Existing Buildings: Building codes may require the retrofitting of older structures to meet modern safety standards.
- Public Awareness: Building codes promote public awareness of hazards and the importance of resilient construction. This can lead to informed decision-making by property owners, builders, and developers, resulting in safer structures.

Key hazard resistant building code provisions found in current building codes include:

- Structural Design Requirements: Provides requirements for the structural design of buildings to ensure their resistance to various hazards, including earthquakes, high winds, and snow loads. These requirements are aimed at enhancing the overall structural integrity and safety of buildings.
- Wind Design Requirements: Provides specific provisions for wind design, considering the geographical location of the structure. Wind loads are calculated based on factors such as wind speed, exposure, and building height.
- Seismic Design Requirements: Incorporates seismic design provisions to address earthquake hazards. The code includes seismic design categories and requirements for the design and construction of buildings in seismic-prone regions.
- Flood-Resistant Design Requirements: Includes provisions related to flood-resistant design, particularly in areas prone to flooding. It may specify elevation requirements, construction materials, and other considerations to reduce the risk of flood damage. The vast majority of the regulations required by the NFIP are included within the International Building Code and the International Residential Code.
- Fire-Resistant Construction Requirements: Requirements for fire-resistant construction are included to mitigate the risk of fire hazards. This includes specifications for fire-resistant materials, assemblies, and building features.
- Material and Construction Standard Requirements: Establishes standards for building materials and construction methods to ensure the durability and safety of structures, considering various hazards.

The Nye County Building Department has been established by local ordinance in compliance with state code. It grants counties the right to create an agency to assure that construction and modification of all structures within the unincorporated areas meet the minimum standards as established by the State of Nevada. The department administers and enforces building, heating, ventilation, air conditioning, electrical, and plumbing standards for the protection of life, health, environment, public safety, and the conservation of energy in the design and construction of buildings and structures. This department also serves as the building permit and inspection agency for all participating jurisdictions to ensure compliance with all applicable building laws. The Duckwater Shoshone Nation administers building codes on all Nation lands. Current Codes enforced by Nye County and the Duckwater Shoshone Nation include:

- 2018 Int'l Building Code
- 2018 Int'l Residential Code
- 2018 Int'l Energy Conservation Code

- 2018 Uniform Plumbing Code
- 2018 Uniform Mechanical Code
- 2018 Int'l Mechanical Code
- 2018 Int'l Property Maintenance Code
- 2018 Int'l Swimming Pool, and Spa Code
- 2017 National Electric Code
- 2018 Int'l Fire Code

As part of this planning effort, county personnel charged with regulating or overseeing development were given the opportunity to review and comment of the elements of this plan. The following personnel were identified:

Table 100: Nye County Building or Development Stakeholders

Jurisdiction	Name	Title
Nye County	Brett Waggoner	Director of Planning
Nye County	Albert Cammarata	Building Official
Duckwater Shoshone Nation	Jane Bryan	Division of Community Services Manager

Zoning Ordinances

The Nye County Planning and Code Compliance Department works to guide the growth and development of the County. Current planning involves administering the Nye County Zoning Ordinance, Subdivision Ordinance, and related regulations. This includes processing applications for variances and other land use applications.

Zoning ordinances in Nye County govern land use, development, and building requirements. These ordinances work by dividing the land into different zoning districts and establishing rules and guidelines for land use, building placement, density, and setback within the zoning districts. In general, zoning ordinances establish:

- **Zoning districts:** Areas designated for specific types of land use, such as residential, commercial, industrial, agricultural, mixed-use, or special districts.
- **Land usage within a zoning district:** Specifications as to which activities, buildings, and operations are permitted in each zoning district.
- **Enforcement:** Zoning ordinances are enforced by the local building department or zoning enforcement officers.

Zoning is the traditional, and most common, tool available to local jurisdictions to control the use of land. Zoning is used to promote health, safety, and the general welfare of the community. Zoning is used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population.

Zoning ordinances play a significant role in enhancing hazard resilience for communities and can help reduce vulnerability to various natural and man-made hazards by regulating land use and development practices. In Nye County, locally instituted and enforced zoning ordinances provide for:

- Land Use Planning: Zoning ordinances designate land use zones within a community, ensuring that certain areas are reserved for particular uses. This can prevent the construction of critical infrastructure, homes, or businesses in high-risk zones, such as floodplains or wildfire-prone areas.
- Setback Requirements: Zoning ordinances often mandate specific setbacks, which are distances between structures and property lines or natural features. These setbacks can help prevent buildings from being too close to potential hazards, potentially reducing the risk of damage.
- Building Height and Design Standards: Zoning codes can establish building height limits to reduce exposure to certain hazards. Design standards, including materials and construction methods, can be specified to make structures more resilient.

- Floodplain Management: Many zoning ordinances incorporate floodplain regulations, which dictate where and how buildings can be constructed within flood-prone areas. These regulations may require buildings to be elevated, use flood-resistant materials, or include openings to allow floodwaters to pass through.
- Wildfire Mitigation Zones: In regions susceptible to wildfires, zoning ordinances can establish wildfire mitigation zones with specific requirements for defensible space, fire-resistant landscaping, and building materials to reduce the risk of wildfires spreading to structures.

Properly applied, zoning restrictions are some of the most effective hazard mitigation tools available against a wide variety of hazards.

Floodplain Management Ordinances

Floodplain ordinances and management are one of the most effective hazard mitigation tools available against flooding. Local floodplain ordinances, required for NFIP participants, are often used to prevent inappropriate development in floodplains and to reduce flood hazards. In general, they allow the jurisdiction to:

- Minimize the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage.
- Prevent and minimize loss of life, injuries, and property damage in flood hazard areas.
- Promote the public health, safety and welfare of citizens in flood hazard areas.
- Manage planned growth.
- Grant permits for use in development within special flood hazard areas that are consistent with the community ordinance and the NFIP under 44 CFR 60.3.

The NFIP floodplain management regulations work alongside local building codes by providing specific flood-related requirements that must be met in addition to general building code standards. In NFIP communities, when constructing or substantially improving a structure in a Special Flood Hazard Area (SFHA), the structure must be elevated to or above the Base Flood Elevation (BFE), which is a requirement imposed by the NFIP's regulations.

Of all participating jurisdictions, only Nye County has implemented a floodplain ordinance as required by participation in the NFIP.

Water Conservation Ordinances

Water conservation ordinances are regulatory measures implemented to promote responsible water use and mitigate the impacts of drought. These ordinances establish rules, restrictions, and incentives aimed at reducing water consumption, preserving water resources, and promoting sustainable practices. Water conservation ordinances promote efficient water use, the reduction of water waste, and the safeguarding of water resources. By implementing a comprehensive approach that combines regulations, incentives, education, and enforcement, communities can enhance resilience to drought and minimize the adverse impacts of water scarcity.

Nye County Ordinance 514 concerns water conservation and includes consideration of landscape planning and installation and maintenance standards, landscape area requirements, turf restrictions, prohibited plantings, and water conservation standards and watering restrictions for new construction.

The following table details the status of these codes and ordinances for participating jurisdictions:

Table 101: Nye County Jurisdictional Codes and Ordinances

Jurisdiction	Building Code	Floodplain Ordinance	Zoning Ordinance	Water Conservation Ordinance
Nye County	x	x	x	x
Amargosa Valley	x		x	

Table 101: Nye County Jurisdictional Codes and Ordinances

Jurisdiction	Building Code	Floodplain Ordinance	Zoning Ordinance	Water Conservation Ordinance
Round Mountain	x		x	
Tonopah	x		x	
Duckwater Shoshone Nation	x		x	

5.3 Jurisdictional Compliance with NFIP

All NFIP participating jurisdictions are required to meet the minimum standards set forth in the program. The jurisdictions' NFIP coordinator ensures all new construction projects are properly surveyed and receive an elevation certificate.

NFIP participants are committed to continued involvement and compliance. To help facilitate compliance, NFIP participating jurisdictions:

- Adopted floodplain regulations through local ordinance
- Enforces floodplain ordinances through building restrictions
- Regulates new construction in Special Flood Hazard Areas as outlined in their floodplain ordinance
- Utilizes FEMA DFIRMs, where available
- Monitors floodplain activities

As part of this planning effort, Nye County NFIP Coordinators were given the opportunity to review and comment of the elements of this plan. The following individuals designated as NFIP Coordinators identified:

Table 102: Nye County Jurisdictional NFIP Coordinators

Jurisdiction	NFIP Coordinator	Title
Nye County	Qiana Medici	Floodplain Administrator
Nye County	Cheryl Beeman	Floodplain Administrator

Source: Nye County

Participation in the NFIP is based on an agreement between the municipality and the federal government. If a municipality agrees to adopt and enforce a floodplain ordinance designed to reduce future flood risks, all citizens in the participating municipality can purchase flood insurance.

In Nye County, as part of NFIP participation communities must:

- Use current NFIP flood maps in adopting floodplain management regulations.
- Require permits for all development in SFHAs
- Ensure that development does not increase the flood hazard on other properties.
- Meet current elevation standards. Ensuring the lowest occupied floor is elevated to or above the base flood elevation indicated on the NFIP flood map.

While most floodplain requirements have been incorporated into the current Building Codes, some additional provisions and regulations may be required by a community. Communities participating in the NFIP are required to adopt, enforce and maintain a local floodplain ordinance as a stipulation of compliance with the program. The purpose of this ordinance is to ensure public safety, minimize impact to persons and property from flooding, protect watercourses from encroachment, and maintain the capability of floodplains to retain and carry off floodwaters. The local floodplain administrator is typically the municipal official responsible for overseeing the enforcement and update of the document.

The following figure represents both pre- and post-disaster community NFIP requirements:

Figure 3: Pre- and Post-Disaster Community NFIP requirements

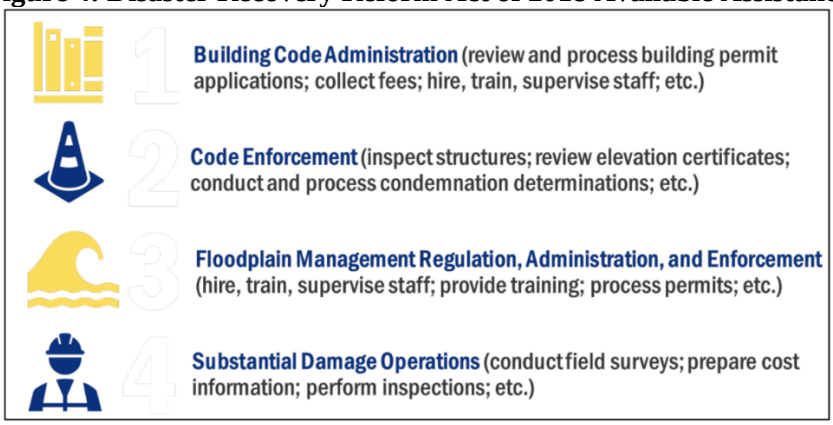
Source: FEMA

When structures located in the SFHAs are substantially modified (more than 50% damaged or improved) they are required to be brought into compliance with current NFIP standards and local building codes. In cases of repairs being conducted as a result of damage, jurisdictional NFIP Coordinators are responsible for substantial damage and improvement determinations. These determinations are required for compliance in the NFIP and must be completed before residents begin repairs or permits are issued.

However, the May 2020 Report to Congressional Committees on the National Flood Insurance Program by the United States Government Accountability indicates "FEMA generally does not collect or analyze the results of these assessments, limiting its ability to ensure the process operates as intended. Furthermore, FEMA has not clarified how communities can access NFIP claims data. Such data would help communities target substantial damage assessments after a flood." This has been found to be true in the Nye County, with submitted information and data underutilized and some FEMA available data unshared and/or unadvertised.

Section 1206 of the Disaster Recovery Reform Act of 2018 authorizes the FEMA to provide communities with the resources to administer and enforce building code and floodplain management ordinances following a major disaster declaration through FEMA's Public Assistance Program. To be eligible for reimbursement under the Public Assistance Program, including for the Disaster Recovery Reform Act of 2018 Section 1206, communities must be designated for Public Assistance permanent work under a major disaster declaration and be legally responsible to administer and enforce building codes or floodplain management regulations. Communities must also be in good standing with the NFIP. Available assistance includes:

Figure 4: Disaster Recovery Reform Act of 2018 Available Assistance



Source: FEMA

It is worth noting that this assistance is available for a variety of hazards occurrence types, not just flooding.

Key to achieving across the board reduction in flood damages is a robust community assistance, education, and awareness program. As such, NFIP participating jurisdictions will continue to develop both electronic (including social media) and in person outreach activities.

5.4 Jurisdictional Plans

Planning plays a critical role in hazard mitigation by helping communities identify, assess, and reduce risks associated with natural and man-made hazards. Effective planning involves a proactive, strategic, and comprehensive approach to minimize the impact of disasters and enhance community resilience. Jurisdictions were asked if they had completed the following plans:

- Comprehensive Plan: A comprehensive plan establishes the overall vision for a jurisdiction and serves as a guide to decision making, and generally contains information on demographics, land use, transportation, and facilities. As a comprehensive plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.
- Emergency Operations Plan: An emergency operations plan outlines the responsibility and means and methods by which resources are deployed during and following an emergency or disaster. In Nye County, the overarching county provides emergency operation planning for jurisdictions within its borders.
- Fire Mitigation Plan: A fire mitigation plan is used to mitigate a jurisdiction's wildfire risk and vulnerability. The plan documents areas with an elevated risk of wildfires, and identifies the actions taken to decrease the risk. A fire mitigaion plan can influence and prioritize future funding for hazardous fuel reduction projects, including where and how federal agencies implement fuel reduction projects on federal lands.
- Flood Mitigation Assistance Plan: The purpose of the flood mitigation assistance plan is to reduce or eliminate the long-term risk of flood damage to buildings and other structures insured under the NFIP.

The Nye County Comprehensive Plan is a document which guides the County's growth. The Nye County Planning Department is responsible for the development of the Comprehensive Plan as well as other long-term planning projects and studies.

The Duckwater Shoshone Sustainability Plan details the approach the Nation will take towards continued renewable energy community development, while the 2012 Duckwater Shoshone Master Plan Update sets policies that help the Nation support and guide infrastructure growth and economic sustainability. It also provides the historical context, background and current data necessary to understand issues and choose solutions as well as seek various forms of funding.

The following table details the status of these plan types for each participating jurisdiction:

Table 103: Nye County Jurisdictional Plans

Jurisdiction	Comprehensive Plan	Emergency Operations Plan	Fire Mitigation Plan	Flood Mitigation Assistance Plan
Nye County	x	x	x	x
Amargosa Valley		Under county		
Round Mountain	x	Under county		
Tonopah	x	Under county		
Duckwater Shoshone Nation	x	Under county		

5.5 Fiscal Capabilities

The following fiscal capabilities are available to the county and participating jurisdictions to enact hazard mitigation projects:

- Authority to levy taxes for specific purposes
- Capital Improvement Plans and Impact Fees, Pahrump Regional Planning District
- Incur debt through general obligation bonds
- Incur debt through special tax and revenue bonds
- Incur debt through private activity bonds

Specific to the Duckwater Shoshone Nation, the following fiscal avenue is available to fund hazard mitigation projects:

- Nation General Fund

On a yearly basis, Nye County, participating jurisdictions, and the Duckwater Shoshone Nation fully allocated available revenue to basic services and programs. As a result, funding for mitigation projects is often unavailable or severely limited. While the capability to assess special taxes or issue bonds does exist, historically it has been shown that passing these measures is extremely difficult.

5.6 Tribal Pre- and Post-Disaster Management and Programs

In general, the Duckwater Shoshone Nation utilizes the following positions and groups to enact pre- and post-disaster management strategies:

- Tribal Council: Sets policy, direction, approval of expenditures, designation of roles and responsibilities of tribal government staff and recovery personnel, and approval of the recovery plan.
- Emergency Manager: Typically, responsible for coordination and direction of response, life safety, sheltering, and feeding.

Additionally, the Nation relies on the Nye County Emergency Operations plan for response guidance.

5.6 Challenges and Opportunities for Capability Improvement

As always, challenges exist for all participating jurisdictions due to the day-to-day demands of the working environment including staffing issues, budget restrictions, and staffing turnover. These issues can, and do, impact the utilization and incorporation of the HMP and the completion of identified hazard mitigation projects.

As part of this planning process, the MPC worked to identify gaps and deficiencies identified in the completion of this HMP. Resulting from this assessment is a series of problem statements, concise descriptions of issues or challenges that need to be addressed. These problem statements were determined to be applicable to all participating jurisdictions:

- Continued climate change is driving an increased incidence of major hazard occurrences, stressing the response, recovery, and mitigation capabilities of even the most prepared jurisdiction.
- Available funding for the completion of hazard mitigation projects is at a premium, with all participating jurisdiction seeing minimal room in the budget for any required project match.
- The difficulties in applying for and managing hazard mitigation grants is beyond the capability of smaller jurisdictions.
- Staffing at all levels is stretched thin, with many personnel wearing multiple hats, compromising mitigation capabilities.

Improving capabilities can lead to enhanced performance, increased efficiency, and better outcomes in hazard mitigation planning and implementation. The following identify recommended improvements for all jurisdictions, with some recommendations being applicable to all jurisdictions, and other being specific to identified jurisdictions:

- All participating jurisdictions should build a relationship with local meteorologists and the NWS to give priority access to rapidly developing weather conditions.
- All participating jurisdictions could receive instruction from the State of Nevada Division of Emergency Management and FEMA Region IX on grant application processes and grant management strategies. These classes could help all participating jurisdictions receive available grant funding.
- All participating jurisdictions should consider adoption of the 2021 International Building Codes to ensure current constructions standards, including climate resiliency standards.

- Amargosa Valley, Beatty, Gabbs, Round Mountain and the Duckwater Shoshone Nation would all benefit from the creation of comprehensive plans to help plan and budget for hazard mitigation measures, policies, and procedures
- All participating jurisdictions, with the exception of Nye County, should investigate NFIP participation to allow citizens to purchase federally backed flood insurance.
- Nye County, a current NFIP participant, should apply for membership in the CRS to allow citizens to receive discounts off their federally backed flood insurance policies.
- All participating jurisdictions should explore engaging in public-private emergency planning partnerships to further increase hazard resiliency through the infusion of additional funding and expertise to help complete mitigation projects.

Additionally, to help overcome many of these identified challenges, NCOEM, the Duckwater Shoshone Nation, the MPC, and participating jurisdictions will work collaboratively using the following strategies, as appropriate:

- Innovation and Adaptation: Foster a culture of innovation and adaptability. Encourage employees to think creatively, embrace change, and explore new ways of doing things to overcome challenges.
- Training and Development: Invest in training and development to enhance skills and knowledge.
- Communication Improvement: Enhance communications and provide clear and transparent communication when sharing information, aligning teams, and addressing concerns.
- Collaboration and Teamwork: Encourage collaboration and teamwork which allows for the pooling of diverse skills and perspectives, leading to more effective problem-solving (the MPC is a good example of effective use of this strategy).
- Technology Adoption: Embrace technology to streamline operations and enhance productivity.
- Agile Project Management: Implement agile project management methodologies to enhance flexibility and responsiveness to changing conditions. Agile approaches allow teams to adapt quickly to challenges.

As appropriate, these strategies will be tailored for specific circumstances, with a combination of these strategies often being more effective than relying on a single approach.

Section 6 – Mitigation Strategy

6.1 Introduction

As part of this planning effort, Nye County, the Duckwater Shoshone Nation, and participating jurisdictions worked to minimize the risk of future impacts from identified hazards to all citizens of the county. In an attempt to shape future regulations, ordinances and policy decisions, the MPC reviewed and developed a hazard mitigation strategy. This comprehensive strategy includes:

- The consistent review and revision, as necessary, of obtainable goals and objectives
- The consistent review, revision and development of a comprehensive list of potential hazard mitigation actions

The development of a robust mitigation strategy allows for:

- The ability to effectively direct limited resources for maximum benefit
- The ability to prioritize identified hazard mitigation projects to maximize positive outcomes
- The increase in public and private level participation in hazard mitigation through transparency and awareness
- The potential direction of future policy decisions through awareness and education
- The achievement of the ultimate goal of a safer Nye County for all our citizens

As per the previous hazard mitigation plan, and considering all of the factors listed above, the MPC continues to implement the following mitigation strategy:

- **Implement** the action plan recommendations of this plan.
- **Use** existing regulations, policies, programs, procedures, and plans already in place.
- **Monitor** multi-objective management opportunities, share and package funding opportunities, and garner broader constituent support.
- **Communicate** the hazard information collected and analyzed through this planning process so that local governments and residents better understand where disasters occur, and what they can do to mitigate their impacts. In doing so, also publicize the success stories that have been achieved through the County's ongoing mitigation efforts.

6.2 Identification of Goals

The following goals for hazard mitigation were established from the MPC's discovery and deliberation process, which consisted of:

- A review of identified hazards, vulnerabilities and impacts
- A review of hazard events subsequent to the last hazard mitigation plan revision
- A review of demographic, infrastructure and built environment data
- A review of the goals and objectives identified in previous hazard mitigation plans
- A review of local mitigation strategies and goals
- A review completed and remaining hazard mitigation actions

These goals represent a vision for hazard mitigation and disaster resistance for Nye County and the Duckwater Shoshone Nation. Each mitigation goal was reviewed and approved by both MPC members and stakeholders. Through group discussions at meetings, the MPC refined and combined the identified goals from the previous hazard mitigation plan. During this process it was determined that the priorities of the overall community in relation to hazard mitigation planning have not changed during the five years of the previous planning cycle. The identified goals are as follows:

- **Goal 1:** Reduce the risk to the people and property from the identified hazards in this plan.
- **Goal 2:** Work to protect all vulnerable populations, structures, and critical facilities from the impacts of the identified hazards.

- **Goal 3:** Improve public outreach initiatives to include education, awareness, and partnerships with all entities in order to enhance the understanding of identified hazards and hazard mitigation opportunities.

The MPC will continuously evaluate these identified goals and objectives against current capabilities and conditions. As part of this process, NCOEM will collect and analyze data and feedback from the MPC and plan stakeholders to help identify gaps, roadblocks, and achievements. Using this information, strategies will be developed to bridge identified gaps, remove identified roadblocks, and celebrate identified successes in achieving the goals of the HMP. Additionally, when necessary, NCOEM and the MPC will modify, update, or expand identified goals based on the review process.

6.3 Classification of Mitigation Actions

For this plan update members of the MPC were provided with a complete list of previously identified mitigation actions and asked to review them to determine their status. Previously identified mitigation status was reported using the following definitions:

- **Completed:** The action has been fully completed.
- **Not Completed:** The action was not started or has been started and is not completed.
- **Revised:** Action has been revised to reflect current planning environment or identified changes.
- **Cancelled:** The action has been removed from consideration due to either a lack of resources or changing mitigation priorities.
- **Ongoing:** The action is completed and has become an ongoing activity or capability.

Additionally, MPC members and stakeholders were provided with forms to identify and incorporate newly identified actions based on the changing hazard environment or previously unidentified needs. A wide range of activities were considered based on the following factors:

- Updated state risk assessment and information from local risk assessments
- Goals and objectives
- Existing state actions
- State and local capabilities
- Actions identified in local plans

In preparing a mitigation strategy all reasonable and obtainable mitigation actions were considered to help achieve the general goals. Priorities were developed based on past damages, existing exposure to risk, and weaknesses identified by the State and local capability assessments. In identifying mitigation actions, the following activities were considered:

- The use of applicable building construction standards
- Hazard avoidance through appropriate land-use practices
- Relocation, retrofitting, or removal of structures at risk
- Removal or elimination of the hazard
- Reduction or limitation of the amount or size of the hazard
- Segregation of the hazard from that which is to be protected
- Modification of the basic characteristics of the hazard
- Control of the rate of release of the hazard
- Provision of protective systems or equipment for both cyber or physical risks
- Establishment of hazard warning and communication procedures
- Redundancy or duplication of essential personnel, critical systems, equipment, and information materials.

In general, all identified mitigation actions were classified under one of the following broad categories:

- **Local Plans and Regulations:** Actions that create or update plans to reflect situational changes and/or actions that aid in the creation, revision, or adoption of regulations related to hazard mitigation and management.
- **Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- **Preparedness and Response:** Emergency response or operational preparedness actions.
- **Public education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.
- **Structural:** Actions that the modification of existing buildings or structures or involve the construction of structures to reduce the impact of hazard.

6.4 Prioritization of Mitigation Actions

The MPC and subject matter experts worked together to prioritize both previously identified and newly identified hazard mitigation actions. The methodology used to determine mitigation action priorities was based upon the following:

- Review of the updated risk assessments
- Review of revised goals and objectives
- Review of local capabilities

In formulating a mitigation strategy, a wide range of activities were considered to help achieve identified goals and to lessen the vulnerability to the effects of identified hazards.

A self-analysis method was used for determining and prioritizing mitigation actions. This methodology takes all considerations into account to ensure that, based on capabilities, funding, public wishes, political climate, and legal framework and context, reasonable actions are determined. The following provides a brief description of each consideration:

- Are all people within the jurisdiction being treated equally and fairly?
- Will the action disrupt the social fabric of the jurisdiction?
- Does the proposed action work and is it technically feasible?
- Does the action offer a long-term solution to the problem?
- Does the jurisdiction have adequate staffing?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding available?
- Are there ongoing administrative requirements that need to be met?
- Does the action have political and public support?
- Does the jurisdiction have the legal authority to implement the action?
- Will the jurisdiction be liable for the action or for any inaction?
- Could the action face any legal challenges?
- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Has funding for the action been identified?

Identified actions were prioritized and were given one of the following rankings:

- **High:** Actions that should be implemented as soon as possible
- **Medium:** Actions that should be implemented in the long-term
- **Low:** Actions that should be implemented if funding becomes available

Of major concern was the potential or identified cost of each action. In general, identified actions were proposed to reduce future damage. As such, it is critical that selected and implemented actions provide a greater saving over the life of the action than the initial cost. Prior to the implementation of any action a Benefit-Cost Analysis that determines the future risk reduction benefits of a hazard mitigation project and compares those benefits to its costs will be conducted as required. Applicants and sub-applicants must use FEMA approved methodologies and tools, such as the Benefit-Cost Analysis Toolkit, to demonstrate the cost-effectiveness of their projects. The result is a Benefit-Cost Ratio, and a project is considered cost-effective when the Benefit-Cost Ratio is 1.0 or greater. Depending on the project, either a full Benefit-Cost Analysis will be completed by entering documented values into the FEMA Benefit-Cost Analysis Toolkit, which calculates a benefit-cost ratio or, if the project meets specified criteria, a streamlined Benefit-Cost Analysis may be completed (FEMA's cost-effectiveness requirement is never waived).

For structural and property protection actions cost effectiveness is primarily assessed on:

- Likelihood of damages occurring
- Severity of the damages
- Potential effectiveness

For all other types of actions cost effectiveness is primarily assessed on likely future benefits as these actions may not easily result in a quantifiable reduction in damage.

6.5 Mitigation Action Funding Sources

It is generally recognized that mitigation actions help realize long term savings by preventing future losses due to hazard events. However, many mitigation actions are beyond the budgetary capabilities of a single jurisdiction. This section provides a general description of some of the avenues available to defray the cost of implementing mitigation actions.

FEMA provides financial assistance to state, local, tribal, and territorial governments, as well as certain private non-profit organizations, to implement projects that help reduce the risk and impact of future disasters. These grant programs are designed to support initiatives aimed at mitigating hazards and improving resilience. The main grant program offered by FEMA for hazard mitigation is the Hazard Mitigation Assistance (HMA) program. The HMA program includes four subprograms, the Hazard Mitigation Grant Program (HMGP), the HMGP Post-Fire, Building Resilient Infrastructure and Communities (BRIC), and the Flood Mitigation Assistance (FMA) grant program. Applicants to these grant programs are required to submit project proposals that demonstrate the effectiveness of their proposed mitigation projects. The eligibility criteria, application process, and specific requirements for each program are outlined by FEMA in their guidelines and announcements, which are typically published on FEMA's website.

The following provides a general overview of major grant funding streams:

- **HMGP and HMGP Fire:** The HMGP grants assist in implementing long-term hazard mitigation measures following Presidential disaster declarations, including fire declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.
- **BRIC:** BRIC supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. Working in coordination with BRIC, the National Mitigation Investment Strategy is intended to provide a national, whole-community approach to investments in mitigation activities and risk management.
- **FMA Grant Program:** FMA is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the NFIP. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project. FEMA requires state, local, tribal and territorial governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects.

The following chart summarizes HMA grants programs:

Chart 18: HMA Grant Program Summary

HMA Program Comparison	HMGP	HMGP Post Fire	BRIC	FMA
Program Type	Post-disaster	Post-disaster	Pre-disaster	Pre-disaster
Funding Availability	Presidentially declared disaster	FMAG-declared disaster	6% set aside from federal post-disaster grant funding	Annual appropriations
Competitive?	No	No	Yes	Yes
Eligible Applicants	States, federally recognized tribes, territories and the District of Columbia (DC)	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC
Eligible Subapplicants	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments and tribes	State agencies, local governments and tribes
Hazard Mitigation Plan Requirement	Yes	Yes	Yes	Yes
NFIP Participation	Communities with projects in Special Flood Hazard Areas (SFHAs)	Communities with projects in SFHAs	Communities with projects in SFHAs	Subapplicants and properties

Additionally, the following provide available grant funding avenues for hazard mitigation projects:

- **Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program:** HHPD awards provide technical, planning, design and construction assistance in the form of grants for rehabilitation of eligible high hazard potential dams. A state or territory with an enacted dam safety program, the State Administrative Agency, or an equivalent state agency, is eligible for the grant.
- **Emergency Management Performance Grant:** Program provides state, local, tribal and territorial emergency management agencies with the resources required for implementation of the National Preparedness System and works toward the National Preparedness Goal of a secure and resilient nation. Allowable costs support efforts to build and sustain core capabilities across the prevention, protection, mitigation, response and recovery mission areas.
- **State Homeland Security Program:** Program includes a suite of risk-based grants to assist state, local, tribal and territorial efforts in preventing, protecting against, mitigating, responding to and recovering from acts of

terrorism and other threats. This grant provides grantees with the resources required for implementation of the National Preparedness System and working toward the National Preparedness Goal of a secure and resilient nation.

- **Nonprofit Security Grant Program:** Program is one of three grant programs that support DHS/FEMA's focus on enhancing the ability of state, local, tribal, and territorial governments, as well as nonprofits, to prevent, protect against, prepare for, and respond to terrorist or other extremist attacks. These grant programs are part of a comprehensive set of measures authorized by Congress and implemented by DHS to help strengthen the nation's communities against potential terrorist or other extremist attacks. Among the five basic homeland security missions noted in the DHS Strategic Plan for Fiscal Years 2020-2024
- **Public Assistance Program:** The mission of FEMA's Public Assistance program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. Through the Public Assistance program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain private non-profit organizations. The Public Assistance Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process. The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The grantee determines how the non-Federal share (up to 25%) is split with the eligible applicants.
- **Individual Assistance Program:** After a disaster, the federal government determines if any county in the state meets the criteria for individual disaster assistance. The decision is based on damage related to the severity and magnitude of the event. When a county receives an Individual Assistance declaration from the President of the United States, anyone who lives in that county can apply for assistance.
- **Small Business Administration Disaster Loans:** The Small Business Administration provides low-interest disaster loans to homeowners, renters, businesses of all sizes, and most private nonprofit organizations. Small Business Administration disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.
- **The Housing and Urban Development Agency**: Provides flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.
- **Community Development Block Grant Program**: This is a flexible program that provides communities with resources to address a wide range of unique community development needs. The program provides annual grants on a formula basis to general units of local government and States.
- **Individual and Households, Other Needs Assistance Program:** This program provides financial assistance to individuals or households who sustain damage or develop serious needs because of a natural or man-made disaster. The funding share is 75% federal funds and 25% state funds. The program provides grants for necessary expenses and serious needs that cannot be provided for by insurance, another federal program, or other source of assistance. The current maximum allowable amount for any one disaster to individuals or families is $25,000. The program gives funds for disaster-related necessary expenses and serious needs, including personal property, transportation, medical and dental, funeral, essential tools, flood insurance, and moving and storage.
- **WUI Grants:** The 10-Year Comprehensive Strategy focuses on assisting people and communities in the WUI to moderate the threat of catastrophic fire through the four broad goals of improving prevention and suppression, reducing hazardous fuels, restoring fire-adapted ecosystems, and promoting community assistance. The WUI Grant may be used to apply for financial assistance towards hazardous fuels and educational projects within the four goals of: improved prevention, re duction of hazardous fuels, restoration of fire-adapted ecosystems and promotion of community assistance.
- **Bureau of Indian Affairs Aid to Tribal Governments:** This program provides funds to Indian Tribal governments to support general Tribal government operations, to maintain up-to-date Tribal enrollment, to conduct Tribal elections, and to develop appropriate Tribal policies, legislation, and regulations. Funds may be

used in a variety of ways to strengthen the capabilities of Indian tribes in self-government, community planning, and maintenance of membership records.

- **Bureau of Indian Affairs Replacement and Repair of Indian Schools:** Providing safe, functional, code-compliant, economical, and energy efficient education facilities for American Indian students attending Bureau of Indian Affairs owned or funded primary and secondary schools or residing in Bureau owned or funded dormitories.
- **Bureau of Indian Affairs Wildland Fire Management:** Cooperative agreements for grants and reimbursable costs related to wildland fire management directly associated with programs contracted by tribes under the authority of the National Indian Forest Resources Management Act.

Small and impoverished communities that receive grants may receive a federal cost share of up to 90% of the total amount approved under the grant award. As defined in 44 CFR 201.2, a small and impoverished community is:

- A community of 3,000 or fewer individuals that is identified by the State as a rural community
- Is not a remote area within the corporate boundaries of a larger city
- Is economically disadvantaged, by having an average per capita annual income of residents not exceeding 80% of national, per capita income
- The local unemployment rate exceeds by one percentage point or more, the most recently reported, average yearly national unemployment rate
- Any other factors identified in the State Plan in which the community is located

6.6 Completed Mitigation Actions

Nye County, participating jurisdictions remain committed to investigating and obtaining all available grant funding for the completion of hazard mitigation projects. Since the completion of the previous HMP in 2013 the MPC has been tracking the completion status of all identified hazard mitigation actions, with one identified as completed. On May 16, 2017 the county passed Ordinance 514 mandating water conservation (previous plan action number 2.A.1).

Neither Nye County nor any participating jurisdictions have received any FENA Hazard Mitigation Grant funding (HMGP, BRIC, PDM, FMAG) as of this plan. However, the following non-FEMA grants and funding have been awarded.

- Community Development Block Grant: $500,000 for the construction of a new fueling system at the Tonopah Airport in Nye County.
- Conservation Infrastructure Initiative Grant Award: A $3,873,038 grant award through the Nevada Department of Conservation and Natural Resources to improve the Gabb's Water System.
- Environmental Protection Agency Brownfields Assessment Grant: Awarded a $434,000 grant to conduct environmental site assessments and prepare cleanup and reuse plans. Priority sites include the Duckwater Shoshone Tribe solid waste facility.
- Coronavirus State and Local Fiscal Recovery Funds through the American Rescue Plan Act:
    - $2,430,000 for the construction of a facility for the purpose of public refuge related to a pandemic, natural disaster, and other large-scale public health/safety/security event.
    - $300,000 to assist vulnerable populations, including children & families with housing support and coordination.
    - $175,000 for the construction of signage at fire stations in Pahrump.
    - $285,000 for Nye County Water District to engage with a vendor to provide cloud seeding service.

6.7 Jurisdictional Mitigation Actions

During this plan update, the MPC assessed existing actions and developed new actions for consideration based on:

- Updated risk assessments
- Goals and objectives
- Local capabilities

While the Nye County hazard mitigation program has matured over the years, an unfortunate lack of funding and grant opportunities has prevented the completion of any major hazard mitigation projects. As such, relevant actions from the previous hazard mitigation plan are identified as carried over and are awaiting funding to start.

Nye County. Participating jurisdictions, and the Duckwater Shoshone Nation elected to delete mitigation actions not related to any identified hazards detailed in this plan (hazard not considered), and actions that were considered part of a standard operating procedure (programmatic). Deleted actions are identified in the following table along with the reason for deletion.

Table 104: Deleted Hazard Mitigation Actions

Previous HMP Action Number	Description	Rationale for Removal
4.A.1	Use the County's web site to post information regarding the safe handling and disposal of household chemicals. Provide public outreach programs to educate, collect and dispose of household items properly.	Hazard not considered
4.A2	Review known hazmat sites within the County boundaries and within well-head protection sites.	Hazard not considered
6.A.1	Continue to enforce the International Building Code (IBC) provisions pertaining to grading and construction relative to seismic hazards	Programmatic
7.A.1	Prepare a list of high-risk residents who will need assistance in the event of a major snowstorm to ensure that they are checked on and have their situation mitigated for access purposes as soon as possible.	Programmatic
8.A.1	Continue public awareness of potentially dangerous diseases, historic outbreaks and the transmission of such between communities.	Hazard not considered
8.A.2	Develop and educate the public regarding action plan in case of large scale outbreak.	Hazard not considered
11.A.1	Continue to develop and update County-wide GIS hazard maps with information on hazard areas, and critical facilities and infrastructure	Programmatic
11.A.2	Seek new data from other government, academic, and private organizations that can be used for hazard mitigation and emergency response.	Programmatic
11.A.3	Share hazard and risk information with nearby jurisdictions, private and public organizations, and the general public	Programmatic
12.A.2	Develop and provide public education regarding emergency preparations and recovery options; and at-risk populations (including disabled, children and elderly).	Programmatic
1.A.1 (Nation)	Update MOUs with the County to share resources to help mitigate hazards.	Programmatic

The following actions, identified in the previous hazard mitigation plan, have been carried forward to this plan. Please note that the action description may have been updated for clarity:

Table 105: Carried Over Hazard Mitigation Actions

New Action Number	Previous Action Number	Description
Nye County 5	2.A.3	Develop an incentive program to install drought resistant landscaping.
Nye County 6	2.A.4	Propose and support legislation to secure new water rights.
Nye County 10	6.A.2	Retrofit all county facilities to meet seismic standards
Nye County 11	6.A.3	Conduct public education campaign on home seismic retrofits.
Nye County 12	9.A.1	Develop and adopt setbacks from known fault locations.
Nye County 16	3.A.2	Require engineered floodplain and hydrologic analysis to be prepared for all new development projects within the 100-year floodplain .
Nye County 17	3.A.4	Join the Community Rating System.
Nye County 18	3.A.1	Construct rainwater retention/detention ponds at strategic locations.
Nye County 19	3.A.5	Develop flood control facility for Winery Road and Basin Road.
Nye County 20	12.A.2	Develop and provide public education for emergency evacuation programs for neighborhoods in flood prone areas.
Nye County 23	10.A.1	Obtain lightning detection systems for public outdoor venues.
Nye County 24	5.A.2	Develop a public awareness program for high wind standards for private signage.
Nye County 26	5.A.1	Develop a public awareness program to assist property owners in selecting trees that are power line friendly and placement options to protect lines.
Nye County 27	1.A.1	Continue to coordinate with federal and state partners on fuel management and mitigation efforts.
Nye County 29	1.A.2	Develop and provide public education for emergency evacuation programs for neighborhoods in wildland fire areas.
Nye County 30	1.A.3	Conduct program at all critical facilities to create defensible spaces and buffer zones void of vegetative fuel
Nye County 35	7.A.2	Develop a public outreach campaign about building winterization.
Nation 15	1.A.2	Implement hazardous fuels reduction program.
Nation 16	1.A.3	Conduct wildfire education program for public.

For each identified action, the following applies:

- New actions that have been added to this plan update are identified as such
- Some actions have been reassigned or reclassified. In these cases, not all information is provided under the original listing, rather the newly assigned responsible entity has been given the opportunity to detail the requested information
- All mitigation action information was provided by jurisdictional officials through outreach from the MPC

The following table provides a mitigation action cross check for each participating jurisdiction. Please note that the Dam Failure hazard is not a concern for Amargosa Valley, the Duckwater Shoshone Nation, or Tonopah as there are no high or significant hazard dams within those jurisdictions.

Table 106: Participating Jurisdiction Mitigation Action Cross Check

Hazard	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Dam Failure	1, 2, 3	-	-	1, 2	-
Drought	1, 4, 5, 6, 7, 8	1, 2, 3	1, 2, 3	3, 4	1, 2, 3
Earthquake	1, 9, 10, 11, 12	4, 5	4, 5	5, 6	4, 5
Extreme Heat	1, 13, 14	6, 7	6, 7	7, 8	6, 7

Table 106: Participating Jurisdiction Mitigation Action Cross Check

Hazard	Nye County	Amargosa Valley	Duckwater Shoshone Nation	Round Mountain	Tonopah
Flood	1, 15, 16, 17, 18, 19, 20, 21, 22	8 ,9, 10	8, 9, 10	9, 10, 11	8, 9, 10
Severe Thunderstorm	1, 23, 24, 25, 26	11, 12, 13	11, 12, 13	12, 13, 14	11, 12, 13
Wildfire	1, 27, 28, 29, 30, 31, 32	13, 14, 15, 16	14, 15, 16	14, 15, 16, 17	13, 14, 15, 16
Winter Storm	1, 33, 34, 35	11, 17	11, 17	12, 18	11, 17

-: Jurisdiction not impacted by identified hazard

The following tables identify mitigation action items for each participating jurisdiction, along with the following information:

- Hazard addressed
- Responsible party
- Overall priority
- Goal(s) addressed
- Estimated cost
- Potential funding source
- Proposed completion timeframe
- Current status

It is important to note that when assigning a responsible party for these actions, with the exception of Nye County and the Duckwater Shoshone Nation, the participating jurisdictions have limited staff and departments. As such, the overall assignment has been given to the highest-ranking employee.

Table 107: Nye County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Nye County 1	Purchase and install critical facility backup generators.	All Hazards	NCOEM, Nye County Facilities Department	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Nye County 2	Update inundation mapping for all significant hazard dams.	Dam Failure	NCOEM	Low	1, 2	$5,000 - $50,000 per location	HMGP, BRIC, Local budgets	Ten years	New
Nye County 3	Purchase and install dam failure warning alert equipment.	Dam Failure	NCOEM	Low	1, 2, 3	$50,000 per location	HMGP, BRIC, Local budgets	Five years	New
Nye County 4	Conduct water use education program on water reduction methods.	Drought	NCOEM	High	1, 3	Staff Time	Local budgets	Five years	Carried over due to lack of staff
Nye County 5	Develop an incentive program to install drought resistant landscaping.	Drought	NCOEM	Medium	1, 2	Staff time and $500,000	HMGP, BRIC, Local budgets	Five years	Carried over due to lack of funding
Nye County 6	Propose and support legislation to secure new water rights.	Drought	Nye County Administration	Medium	1, 2	Staff Time	Local budgets	Five years	Carried over due to lack of staff
Nye County 7	Revise building codes to require low water flow toilets and faucets.	Drought	Nye County Building Department, Nye County Administration	Medium	1, 2	Staff Time	Local budgets	Five years	New
Nye County 8	Conduct a xeriscaping program for all jurisdictional owned facilities	Drought	NCOEM, Nye County Facilities Director	Low	1, 2	$5,000 - $50,000 per location	HMGP, BRIC, Local budgets	Five years	New
Nye County 9	Provide incentive program to owners to reinforce unreinforced masonry buildings throughout the county.	Earthquake	NCOEM, Nye County Planning/Code Compliance	Medium	1, 2, 3	Facility dependent	HMGP, BRIC, Local budgets	Ten years	Carried over due to lack of funding

Table 107: Nye County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Nye County 10	Retrofit all county facilities to meet seismic standards	Earthquake	NCOEM, Nye County Facilities Department	Medium	1, 2	$75,000 per facility	HMGP, BRIC, Local Budgets	Five years	Carried over due to lack of funding
Nye County 11	Conduct public education campaign on home seismic retrofits.	Earthquake	NCOEM	Medium	1, 2, 3	Staff time and $3,000	HMGP, Local Budgets	Five years	Carried over due to lack of staff
Nye County 12	Develop and adopt setbacks from known fault locations.	Earthquake	NCOEM, Nye County Building Department	Low	1, 2, 3	Staff time	Local budgets	Ten years	Carried over due to lack of staff
Nye County 13	Modernization air conditioning and ventilation systems in jurisdictional facilities.	Extreme Heat	Nye County Facilities Department	Medium	1, 2	$25,000 per facility	HMGP, BRIC, Local budgets	Five years	New
Nye County 14	Identify and establish cooling locations throughout the county.	Extreme Heat	NCOEM	Medium	1, 2	Staff time	Local budgets	Five years	New
Nye County 15	Continued participation and compliance with the **NFIP**.	Flood	NFIP Administrator	High	1, 2	Staff Time	Local budgets	Continuous	Continuous
Nye County 16	Require engineered floodplain and hydrologic analysis to be prepared for all new development projects within the 100-year floodplain **(NFIP)**.	Flood	NFIP Administrator	High	1, 2	Staff Time	Local budgets	Continuous	Continuous
Nye County 17	Join the Community Rating System.	Flood	NFIP Administrator	High	1, 2, 3	Staff Time	Local budgets	Five years	Carried over due to lack of staff

Table 107: Nye County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Nye County 18	Construct rainwater retention/detention ponds at strategic locations.	Flood	Floodplain Manager	High	1, 2	Facility size dependent	HMGP, BRIC, Local budgets	Ten years	Carried over due to lack of funding
Nye County 19	Develop flood control facility for Winery Road and Basin Road.	Flood	Floodplain Manager	High	1, 2	$500,000	HMGP, BRIC, Local budgets	Ten years	Carried over due to lack of funding
Nye County 20	Develop and provide public education for emergency evacuation programs for neighborhoods in flood prone.	Flood	NCOEM, Floodplain Manager	Medium	3	Staff time	Local budgets	Five years	Carried over due to lack of staff
Nye County 21	Conduct a flood insurance awareness program.	Flood	Floodplain Manager	Medium	1, 3	Staff Time	Local budgets	Five years	New
Nye County 22	Procure permanent signage to warn of flood hazard areas	Flood	Floodplain Manager, NCOEM	Medium	1, 2	Location dependent	HMGP, BRIC, Local budgets	Five years	New
Nye County 23	Obtain lightning detection systems for public outdoor venues.	Severe Thunderstorms	Nye County Public Works	Medium	1, 2	$50,000	HMGP, BRIC, Local budgets	Five years	Carried over due to lack of funding
Nye County 24	Develop a public awareness program for high wind standards for private signage.	Severe Thunderstorms	Nye County Public Works	Medium	3	Staff time	Local budgets	Five years	Carried over due to lack of staff
Nye County 25	Install surge protectors in all jurisdictional facilities.	Severe Thunderstorms	NCOEM	Medium	1, 2	$10,000 per location	HMGP, BRIC, Local budgets	Five years	New

Table 107: Nye County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Nye County 26	Develop a public awareness program to assist property owners in selecting trees that are power line friendly and placement options to protect lines.	Severe Thunderstorms	NCOEM	Low	3	Staff time	HMGP, BRIC, Local budgets	Five years	Carried over due to lack of staff
Nye County 27	Continue to coordinate with federal and state partners on fuel management and mitigation efforts.	Wildfire	NCOEM, Fire Departments	High	1, 2	Staff time	Local budgets	Continuous	Continuous
Nye County 28	Conduct removal of debris, natural fuels, and clearing of quick-to-burn vegetation in high hazard areas of the county.	Wildfire	NCOEM, Fire Departments	High	1, 2	$10,000 - $25,000	HMGP, Local budgets	Continuous	Continuous
Nye County 29	Develop and provide public education for emergency evacuation programs for neighborhoods in wildland fire areas.	Wildfire	NCOEM, Fire Departments	High	3	Staff time	Local budgets	Five years	Carried over due to lack of staff
Nye County 30	Conduct program at all critical facilities to create defensible spaces and buffer zones void of vegetative fuel	Wildfire	NCOEM, Fire Departments, Nye County Facilities	High	1, 2	Facility size dependent	HMGP, BRIC, Local budgets	Five years	Carried over due to lack of funding
Nye County 31	Install fire resistant roofing on all jurisdictional facilities.	Wildfire	NCOEM, Nye County Facilities	High	1, 2	Facility size dependent	HMGP, BRIC, Local budgets	Ten years	New

Table 107: Nye County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Nye County 32	Retrofit jurisdictional structures with screened vent enclosures, double paned glass, and spark arrestors.	Wildfire	NCOEM, Nye County Facilities	High	1, 2	Facility size dependent	HMGP, BRIC, Local budgets	Ten years	New
Nye County 33	Construct snow fences along major transportation routes.	Winter Storm	NCOEM, Nye County Public Works	Medium	1, 2	Distance dependent	HMGP, BRIC, Local budgets	Ten years	New
Nye County 34	Insulate water lines in all jurisdictional facilities.	Winter Storm	NCOEM, Nye County Facilities	Medium	1, 2	Facility size dependent	HMGP, BRIC, Local budgets	Ten years	New
Nye County 35	Develop a public outreach campaign about building winterization.	Winter Storm	NCOEM, Nye County Facilities	Medium	1, 2	Facility size dependent	HMGP, BRIC, Local budgets	Five years	Carried over due to lack of staff

Table 108: Amargosa Valley Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Amargosa Valley 1	Install low flow utilities in all jurisdictional buildings.	Drought	Town Administrator	Medium	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Amargosa Valley 2	Conduct a xeriscaping program for all jurisdictional owned facilities	Drought	Town Administrator	Medium	1, 2	$5,000 - $20,000 per facility	HMGP, BRIC, Local Budgets	Ten years	New
Amargosa Valley 3	Conduct a personal water use education program.	Drought	Town Administrator	Low	3	Staff time	HMGP, BRIC, Local Budgets	Five years	New
Amargosa Valley 4	Retrofit all jurisdictional facilities to meet seismic standards	Earthquake	Town Administrator	Low	1, 2	$75,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Amargosa Valley 5	Conduct public education campaign on home seismic retrofits.	Earthquake	Town Administrator	Low	3	Staff time and $3,000	HMGP, Local Budgets	Five years	New
Amargosa Valley 6	Prepare local facilities to serve as local cooling centers.	Extreme Heat	Town Administrator	Low	1, 2	$3,000 per facility	HMGP, Local Budgets	Five years	New
Amargosa Valley 7	Conduct an insulation and energy upgrade efficiency program for all jurisdictional buildings.	Extreme Heat	Town Administrator	Low	1, 2	$75,000 - $125,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Amargosa Valley 8	Construct rainwater retention/detention ponds at strategic locations.	Flood	Town Administrator	Low	1, 2	Location and size dependent	HMGP, BRIC, Local Budgets	As required	New
Amargosa Valley 9	Clean and repair drainage ditches and washes to maintain capacity.	Flood	Town Administrator	Low	1, 2	Location, length, and size dependent	HMGP, BRIC, Local Budgets	Five years	New

Table 108: Amargosa Valley Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Amargosa Valley 10	Stabilize burn scar areas to prevent flash flooding,	Flood	Town Administrator	Medium	1, 2	Location and size dependent	HMGP, Local Budgets	As required	New
Amargosa Valley 11	Purchase and install critical facility backup generators.	Severe Thunderstorms, Winter Storm	Town Administrator	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Amargosa Valley 12	Install surge protectors in all jurisdictional facilities.	Severe Thunderstorms	Town Administrator	Medium	1, 2	$5,000 per location	HMGP, BRIC, Local Budgets	Five years	New
Amargosa Valley 13	Install hail and fire-resistant roofing on all jurisdictional facilities.	Severe Thunderstorms, Wildfires	Town Administrator	Low	1, 2	$50,000 per location	Facility size dependent	Five years	New
Amargosa Valley 14	Retrofit jurisdictional structures with screened vent enclosures, double paned glass, and spark arrestors.	Wildfire	Town Administrator	High	1, 2	Facility size dependent	HMGP, BRIC, Local Budgets	Five years	New
Amargosa Valley 15	Conduct program at all critical facilities to create defensible spaces and buffer zones void of vegetative fuel	Wildfire	Town Administrator	High	1, 2	Facility size dependent	HMGP, BRIC, Local Budgets	As required	New
Amargosa Valley 16	Conduct wildfire education program and outreach programs for public.	Wildfire	Town Administrator	High	3	Staff Time and $2,000	HMGP, Local Budgets	Five years	New
Amargosa Valley 17	Conduct public education program for driving in winter conditions.	Winter Storm	Town Administrator	Low	3	Staff Time	Local Budgets	As required	New

Table 109: Duckwater Shoshone Nation Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Nation 1	Install low flow utilities in all Nation facilities.	Drought	Tribal Council Chairman and Tribal Emergency Manager	High	1, 2	$25,000 - $50,000 per facility	BIA, HMGP, BRIC, Nation Budget	Five years	New
Nation 2	Conduct a xeriscaping program for all Nation owned facilities	Drought	Tribal Council Chairman and Tribal Emergency Manager	High	1, 2	$5,000 - $20,000 per facility	BIA, HMGP, Nation Budget	Ten years	New
Nation 3	Conduct a personal water use education program.	Drought	Tribal Council Chairman and Tribal Emergency Manager	High	3	Staff time	Nation Budget	Five years	New
Nation 4	Retrofit all jurisdictional facilities to meet seismic standards	Earthquake	Tribal Council Chairman and Tribal Emergency Manager	Low	1, 2	$75,000 per facility	BIA, HMGP, BRIC, Nation Budget	Five years	New
Nation 5	Conduct public education campaign on home seismic retrofits.	Earthquake	Tribal Council Chairman and Tribal Emergency Manager	Low	3	Staff time and $3,000	HMGP, Nation Budget	Five years	New
Nation 6	Prepare local facilities to serve as local cooling centers.	Extreme Heat	Tribal Council Chairman and Tribal Emergency Manager	Low	1, 2	$3,000 per facility	HMGP, Nation Budget	Five years	New
Nation 7	Conduct an insulation and energy upgrade efficiency program for all jurisdictional buildings.	Extreme Heat	Tribal Council Chairman and Tribal Emergency Manager	Low	1, 2	$75,000 - $125,000 per facility	BIA, HMGP, BRIC, Nation Budget	Five years	New
Nation 8	Clean and repair drainage ditches and washes to maintain capacity.	Flood	Tribal Council Chairman and Tribal Emergency Manager	High	1, 2	Location and size dependent	BIA, HMGP, BRIC, Nation Budget	As required	New

Table 109: Duckwater Shoshone Nation Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Nation 9	Stabilize burn scar areas to prevent flash flooding,	Flood	Tribal Council Chairman and Tribal Emergency Manager	Medium	1, 2	Location and size dependent	BIA, HMGP, Nation Budget	As required	New
Nation 10	Construct rainwater retention/detention ponds at strategic locations.	Flood	Tribal Council Chairman and Tribal Emergency Manager	Medium	1, 2	Location, length, and size dependent	BIA, HMGP, Nation Budget	Five years	New
Nation 11	Purchase and install critical facility backup generators.	Severe Thunderstorm Winter Storm	Tribal Council Chairman and Tribal Emergency Manager	High	1, 2	$25,000 - $50,000 per facility	BIA, HMGP, Nation Budget	Five years	New
Nation 12	Install surge protectors in all Nation facilities.	Severe Thunderstorm	Tribal Council Chairman and Tribal Emergency Manager	Low	1, 2	$3,000 per facility	BIA, HMGP, Nation Budget	Five years	New
Nation 13	Install fire resistant roofing on all Nation facilities.	Severe Thunderstorm	Tribal Council Chairman and Tribal Emergency Manager	Low	1, 2	$50,000 per location	BIA, HMGP, BRIC, Nation Budget	Five years	New
Nation 14	Create buffer zones void of vegetative fuel at all Nation facilities.	Wildfire	Tribal Council Chairman and Tribal Emergency Manager	High	1, 2	Facility size dependent	BIA, HMGP, Nation Budget	As required	New
Nation 15	Implement hazardous fuels reduction program.	Wildfire	Tribal Council Chairman and Tribal Emergency Manager	High	1, 2	$100,000	BIA, HMGP, Nation Budget	Five years	Carried over due to lack of funding
Nation 16	Conduct wildfire education program for public.	Wildfire	Tribal Council Chairman and Tribal Emergency Manager	High	3	Staff Time	Nation Budget	Five years	Carried over due to lack of staff
Nation 17	Conduct public education program for driving in winter conditions.	Winter Storm	Tribal Council Chairman and Tribal Emergency Manager	Medium	3	Staff Time	Nation Budget	As required	New

Table 110: Round Mountain Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Round Mountain 1	Update inundation mapping for all significant hazard dams.	Dam Failure	Town Administrator	Medium	1, 2	$5,000 - $50,000 per location	HMGP, BRIC, Local budgets	Ten years	New
Round Mountain 2	Purchase and install dam failure warning alert equipment.	Dam Failure	Town Administrator	Low	1, 2, 3	$50,000 per location	HMGP, BRIC, Local budgets	Five years	New
Round Mountain 3	Install low flow utilities in all jurisdictional buildings.	Drought	Town Administrator	Medium	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Round Mountain 4	Conduct a xeriscaping program for all jurisdictional owned facilities	Drought	Town Administrator	Low	1, 2	$5,000 - $20,000 per facility	HMGP, Local Budgets	Ten years	New
Round Mountain 5	Retrofit all jurisdictional facilities to meet seismic standards	Earthquake	Town Administrator	Low	1, 2	$75,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Round Mountain 6	Conduct public education campaign on home seismic retrofits.	Earthquake	Town Administrator	Low	3	Staff time and $3,000	HMGP, Local Budgets	Five years	New
Round Mountain 7	Prepare local facilities to serve as local cooling centers.	Extreme Heat	Town Administrator	Low	1, 2	$3,000 per facility	HMGP, Local Budgets	Five years	New
Round Mountain 8	Conduct an insulation and energy upgrade efficiency program for all jurisdictional buildings.	Extreme Heat	Town Administrator	Low	1, 2	$75,000 - $125,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Round Mountain 9	Construct rainwater retention/detention ponds at strategic locations.	Flood	Town Administrator	Low	1, 2	Location and size dependent	HMGP, BRIC, Local Budgets	As required	New

Table 110: Round Mountain Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Round Mountain 10	Stabilize burn scar areas to prevent flash flooding,	Flood	Town Administrator	Medium	1, 2	Location and size dependent	HMGP, Local Budgets	As required	New
Round Mountain 11	Clean and repair drainage ditches and washes to maintain capacity.	Flood	Town Administrator	Low	1, 2	Location, length, and size dependent	HMGP, BRIC, Local Budgets	Five years	New
Round Mountain 12	Purchase and install critical facility backup generators.	Severe Thunderstorms, Winter Storm	Town Administrator	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Round Mountain 13	Install surge protectors in all jurisdictional facilities.	Severe Thunderstorms	Town Administrator	Medium	1, 2	$5,000 per location	HMGP, Local Budgets	Five years	New
Round Mountain 14	Install hail and fire-resistant roofing on all jurisdictional facilities.	Severe Thunderstorms, Wildfires	Town Administrator	Low	1, 2	$50,000 per location	Facility size dependent	Five years	New
Round Mountain 15	Retrofit jurisdictional structures with screened vent enclosures, double paned glass, and spark arrestors.	Wildfire	Town Administrator	High	1, 2	Facility size dependent	HMGP, BRIC, Local Budgets	Five years	New
Round Mountain 16	Conduct program at all critical facilities to create defensible spaces and buffer zones void of vegetative fuel	Wildfire	Town Administrator	High	1, 2	Facility size dependent	HMGP, BRIC, Local Budgets	As required	New
Round Mountain 17	Conduct wildfire education program for public.	Wildfire	Town Administrator	High	3	Staff Time and $2,000	HMGP, Local Budgets	Five years	New
Round Mountain 18	Conduct public education program for driving in winter conditions.	Winter Storm	Town Administrator	Medium	3	Staff Time	Local Budgets	As required	New

Table 111: Tonopah Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Tonopah 1	Install low flow utilities in all jurisdictional buildings.	Drought	Town Administrator	Medium	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Tonopah 2	Conduct a xeriscaping program for all jurisdictional owned facilities	Drought	Town Administrator	Medium	1, 2	$5,000 - $20,000 per facility	HMGP, BRIC, Local Budgets	Ten years	New
Tonopah 3	Conduct a personal water use education program.	Drought	Town Administrator	Low	3	Staff time	HMGP, BRIC, Local Budgets	Five years	New
Tonopah 4	Retrofit all jurisdictional facilities to meet seismic standards	Earthquake	Town Administrator	Low	1, 2	$75,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Tonopah 5	Conduct public education campaign on home seismic retrofits.	Earthquake	Town Administrator	Low	3	Staff time and $3,000	HMGP, Local Budgets	Five years	New
Tonopah 6	Prepare local facilities to serve as local cooling centers.	Extreme Heat	Town Administrator	Low	1, 2	$3,000 per facility	HMGP, Local Budgets	Five years	New
Tonopah 7	Conduct an insulation and energy upgrade efficiency program for all jurisdictional buildings.	Extreme Heat	Town Administrator	Low	1, 2	$75,000 - $125,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Tonopah 8	Construct rainwater retention/detention ponds at strategic locations.	Flood	Town Administrator	Low	1, 2	Location and size dependent	HMGP, BRIC, Local Budgets	As required	New
Tonopah 9	Clean and repair drainage ditches and washes to maintain capacity.	Flood	Town Administrator	Low	1, 2	Location, length, and size dependent	HMGP, BRIC, Local Budgets	Five years	New

Table 111: Tonopah Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Tonopah 10	Stabilize burn scar areas to prevent flash flooding,	Flood	Town Administrator	Medium	1, 2	Location and size dependent	HMGP, Local Budgets	As required	New
Tonopah 11	Purchase and install critical facility backup generators.	Severe Thunderstorms, Winter Storms	Town Administrator	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, Local Budgets	Five years	New
Tonopah 12	Install surge protectors in all jurisdictional facilities.	Severe Thunderstorms	Town Administrator	Medium	1, 2	$5,000 per location	HMGP, BRIC, Local Budgets	Five years	New
Tonopah 13	Install hail and fire-resistant roofing on all jurisdictional facilities.	Severe Thunderstorms, Wildfires	Town Administrator	Low	1, 2	$50,000 per location	Facility size dependent	Five years	New
Tonopah 14	Retrofit jurisdictional structures with screened vent enclosures, double paned glass, and spark arrestors.	Wildfire	Town Administrator	High	1, 2	Facility size dependent	HMGP, BRIC, Local Budgets	Five years	New
Tonopah 15	Conduct program at all critical facilities to create defensible spaces and buffer zones void of vegetative fuel	Wildfire	Town Administrator	High	1, 2	Facility size dependent	HMGP, BRIC, Local Budgets	As required	New
Tonopah 16	Conduct wildfire education program for public.	Wildfire	Town Administrator	High	3	Staff Time and $2,000	HMGP, Local Budgets	Five years	New
Tonopah 17	Conduct public education program for driving in winter conditions.	Winter Storm	Town Administrator	Medium	3	Staff Time	Local Budgets	As required	New

6.8 Mitigation Action Implementation and Monitoring

Nye County, the Duckwater Shoshone Nation, and participating jurisdictions are responsible for implementing their mitigation actions. To foster accountability and increase the likelihood that actions will be implemented, every proposed action is assigned to a specific department or position as a champion. In general:

- The identified champion will be responsible for tracking and reporting on action status.
- The identified champion should provide input on whether the action as implemented is successful in reducing vulnerability, if applicable.
- If the action is unsuccessful in reducing vulnerability, the identified champion will be tasked with identifying deficiencies and additional required actions.

Additionally, each action has been assigned a proposed completion timeframe to determine if the action is being implemented according to plan.

In general, NCOEM is responsible for monitoring the progress of mitigation activities and projects throughout the county in conjunction with participating jurisdictions, while the Duckwater Shoshone Nation monitors progress of all Nation actions. To facilitate the tracking of any awarded hazard mitigation grants, NCOEM, in conjunction with participating jurisdictions, and the Duckwater Shoshone Nation will compile a list of projects funded throughout the calendar year, if any, and add it to an electronic database. Additionally, the MPC will be solicited annually to provide information on any other mitigation projects that were not funded through hazard mitigation grants for addition to the electronic database.

To track mitigation projects from initiation to closeout, participating jurisdictions will use a project tracking spreadsheet that includes, at a minimum, the following information:

- Applicant/Subrecipient
- Grant Identifier
- Contractor
- Total Cost Estimate
- Federal/Local share
- Award Date
- Period of Performance
- Quarterly Reports
- Subrecipient Risk
- Reimbursements

Upon completion of a project, a member of the NCOEM, the Duckwater Shoshone Nation, or the awarded participating jurisdiction will conduct a closeout site visit to:

- Review all files and documents
- Review all procurement files and contracts to third parties
- Take photos of the completed project

Project closeout packages will generally be submitted 90 days after a project has been completed, and will include the following:

- Summary of documentation
- Pictures of completed project
- Materials, labor and equipment forms, if required
- Close-out certification

6.9 Plan Integration

The Nye County HMP will be incorporated into existing planning mechanisms in varying processes. These processes will be tailored to the unique characteristics of the planning mechanism and the governing structure of each participating jurisdiction. The HMP will be integrated, when possible, into the following:

- **Emergency Management Planning**
  All jurisdictions in the Nye County HMP have deferred their emergency management authority to the NCOEM. NCOEM will utilize the HMP in all planning decisions.
- **Emergency Operations Plans**
  The Nye County Emergency Operations Plan will be reviewed and updated to reflect the most probable and dangerous hazard event scenarios from the HMP's risk assessment. This revision is the responsibility of the NCOEM for all of the jurisdictions participating in this plan. Upon revision completion, all participating jurisdictions and appropriate emergency services will be notified of the revisions and sent out new copies.
- **State of Nevada Hazard Mitigation Plan**
  The state's HMP is required by FEMA regulation to include all local HMPs. The process of integrating the Nye County HMP into this plan is already an established process and is managed by NVDEM.
- **Infrastructure, Development & Construction Projects**
  All jurisdictions in Nye County approach infrastructure, development, and construction projects in the same way. The demographics of Nye County allows for planning to exist only through collaboration with their LEPC, which will be advised by the HMP
- **Nye County LEPC**
  The Nye County LEPC is a conduit for all mitigation actions and projects. It is headed by the NCOEM and meets quarterly, although there is flexibility in their schedule. The location of the meetings is not fixed as to increase jurisdictional participation. Members of the LEPC come from all jurisdictions and a wide variety of local agencies and departments.
- **Capital Improvement & Economic Development Planning**
  Upon adoption of this plan, the NCOEM will notify each participating jurisdiction's authority. The notification will also contain a special notice to incorporate the following procedure into any capital improvement projects or economic development planning they may initiate.

The Nye County HMP will be incorporated into the Duckwater Shoshone Nation's existing planning mechanisms in varying processes. The HMP will be integrated, when possible, into the following:

- **Duckwater Shoshone Nation Sustainability Plan**
  This HMP will help guide the approach the Nation will take towards continued renewable energy community development.
- **Duckwater Shoshone Nation Master Plan Update, 2012**
  This plan will be reviewed and updated to reflect the most probable and dangerous hazard event scenarios from the HMP's risk assessment.
- **Duckwater Shoshone Nation Code**

As detailed in Section 2.5, plan incorporation and integration is crucial for creating a cohesive and coordinated approach to address various aspects of hazard mitigation. While are stakeholders and participating jurisdictions will utilize their internal procedures for plan incorporation and integration, the following represent commonly utilized methods:

- Cross-Referencing:
- Consistency Checks:
- Joint Planning Committees:

- Collaborative Workshops and Meetings:
- Alignment with State and Regional Plans:
- Data Sharing and Analysis:
- Unified Implementation Strategies: This involves identifying common actions and initiatives that contribute to the achievement of multiple goals outlined in various plans.

All participating jurisdictions within Nye County have good working relationships with both each other, the State of Nevada, and FEMA indicating great potential for plan incorporation and integration across the planning area. Where appropriate, NCOEM and the Duckwater Shoshone Nation will take the lead in integrating this HMP into overarching plans, codes, ordinances and any other relevant documents, policies, or procedures.

Appendix A – FEMA Approval Documentation

U.S. Department of Homeland Security
FEMA Region 9
1111 Broadway, Suite 1200
Oakland, CA 94607

FEMA

May 8, 2024

Patrick Lazenby
Planner
Nye County Emergency Management Administration
1510 Siri Lane
Pahrump, NV 89060

Dear Patrick Lazenby:

The *Nye County Multi-Jurisdictional Hazard Mitigation Plan 2023* was officially adopted by Nye County and submitted for final review and approval to the Federal Emergency Management Agency (FEMA). The review is complete, and FEMA finds the plan to be in conformance with the Code of Federal Regulations, Title 44, Part 201, Section 6 (44 C.F.R. 201.6). A list of the status of participating jurisdictions is enclosed with this letter.

This plan approval ensures Nye County continued eligibility for funding under FEMA's Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities program (BRIC), and the Flood Mitigation Assistance (FMA) program. All requests for funding are evaluated individually according to eligibility and other program requirements. Approved hazard mitigation plans may also be eligible for points under the National Flood Insurance Program's Community Rating System (CRS).

FEMA's approval is for a period of five years, effective the date FEMA received the first adoption documentation. For this plan, documentation was received on April 30, 2024 and is considered approved as of then. Prior to **April 30, 2029**, Nye County and all participating jurisdictions must review, revise, and submit their plan to FEMA for approval to maintain eligibility for grant funding. The enclosed plan review tool provides additional recommendations to incorporate into future plan updates.

If you have any questions regarding the planning or review processes, please contact the FEMA Region 9 Hazard Mitigation Planning Team at fema-r9-mitigation-planning@fema.dhs.gov.

Sincerely,

KATHRYN J LIPIECKI

Digitally signed by KATHRYN J LIPIECKI
Date: 2024.05.08 19:30:57 -07'00'

Kathryn Lipiecki
Director, Mitigation Division
FEMA Region 9

Enclosures (2)
Nye County Plan Review Tool, dated April 30, 2024
Status of Participating Jurisdictions, dated May 8, 2024

cc: Alison Kearns, Planning and Implementation Branch Chief, FEMA Region 9
Janell Woodward, State Hazard Mitigation Officer, Nevada Division of Emergency Management

Status of Participating Jurisdictions as of May 8, 2024

Jurisdictions – Adopted and Approved

#	Jurisdiction	Adoption Receipt Date
1	Nye County	April 30, 2024

Jurisdictions – Approvable Pending Adoption

#	Jurisdiction
1	Duckwater Shoshone Nation
2	Amargosa Valley, Town of
3	Round Mountain, Town of
4	Tonopah, Town of

U.S. Department of Homeland Security
FEMA Region 9
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

FEMA

March 19, 2024

Patrick Lazenby
Planner
Nye County Emergency Management Administration
1510 Siri Lane
Pahrump, Nevada 89060

Dear Patrick Lazenby:

The Federal Emergency Management Agency (FEMA) has completed its review of the *Nye County, Nevada Multi-Jurisdictional Hazard Mitigation Plan 2023* and has determined that this plan is eligible for final approval pending its adoption by Nye County and all participating jurisdictions. Please see the enclosed list of approvable pending adoption jurisdictions.

Formal adoption documentation must be submitted to FEMA Region 9 by at least one participating jurisdiction within one calendar year of the date of this letter, or the entire plan must be updated and resubmitted for review. FEMA will approve the plan upon receipt of the documentation of formal adoption.

Once the plan is approved, each participating jurisdiction must adopt the plan within five calendar years of the date of the approval. The adoption of the plan by each jurisdiction ensures that jurisdiction's continued eligibility for funding under FEMA's Hazard Mitigation Assistance (HMA) programs. All requests for funding, however, will be evaluated individually according to the specific eligibility, and other requirements of the particular program under which applications are submitted.

If you have any questions regarding the planning or review processes, please contact the FEMA Region 9 Hazard Mitigation Planning Team at fema-r9-mitigation-planning@fema.dhs.gov.

Sincerely,

STEPHANIE E STEPHENS
Digitally signed by STEPHANIE E STEPHENS
Date: 2024.03.19 12:18:15 -07'00'

for Alison Kearns
Planning and Implementation Branch Chief
Mitigation Division
FEMA Region 9

Enclosures (2)
Nye County Plan Review Tool, dated March 19, 2024
Status of Participating Jurisdictions, dated March 19, 2024

cc: Janell Woodward, State Hazard Mitigation Officer, Nevada Division of Emergency Management

Status of Participating Jurisdictions as of March 19, 2024

Jurisdictions – Adopted and Approved

#	Jurisdiction	Adoption Receipt Date
1	Nye County	4/16/24
2	Duckwater Shoshone Tribal Nation	4/29/24
3	Town of Amargosa Valley	
4	Town of Smoky Valley/Round Mountain	
5	Town of Tonopah	
6		

Jurisdictions – Approvable Pending Adoption

#	Jurisdiction
1	Nye County
2	Duckwater Shoshone Nation
3	Amargosa Valley, Town of
4	Round Mountain, Town of
5	Tonopah, Town of

Appendix B – Jurisdictional Resolutions of Adoption

NYE COUNTY RESOLUTION NO. 2024-11

A RESOLUTION ADOPTING THE NYE COUNTY HAZARD MITIGATION PLAN AS AMENDED 2024.

WHEREAS, the Nye County Board of County Commissioners (hereinafter "Board") recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adoption of a hazard mitigation plan is required as a condition of future grant funding of mitigation projects; and

WHEREAS, on November 19th, 2013, the Board approved and adopted the Nye County Hazard Mitigation Plan, December 2013;

WHEREAS, Nye County participated jointly in the multi-jurisdictional planning process through its Planning Task Force with other local units of government and with the Duckwater Shoshone Tribe to prepare, update and amend the multi-jurisdictional hazard mitigation plan; and

WHEREAS, the Board is aware that revisions and updating of the plan is critical for active and effective hazard mitigation and that Nye County Emergency Management will monitor and record hazard related data and events that can be used to update the hazard mitigation plan; and

NOW, THEREFORE, BE IT RESOLVED by the Nye County Board of County Commissioners as follows:

1. That the Board hereby adopts the Nye County Multi-Jurisdictional Hazard Mitigation Plan, as amended 2024 in its entirety as an official plan and will undertake annual recording of hazard events, their impact duration and cost.
2. That the Board, accepting and adopting the Nye County Multi-Jurisdictional Hazard Mitigation Plan, as amended 2024, submit the adoption of the Nye County Multi-Jurisdictional Hazard Mitigation Plan, as amended 2024 to the Federal Emergency Management Agency officials for approval.

APPROVED this 16th day of April, 2024.

NYE COUNTY BOARD OF
COUNTY COMMISSIONERS:

Debra Strickland, Chair

ATTEST:

Cori Freidhof, Nye County Clerk
and Ex-Officio Clerk of the Board

DUCKWATER SHOSHONE TRIBE

511 Duckwater Falls Road, P.O. Box 140068
Duckwater, Nevada 89314
(775) 863-0227 Phone
(775) 863-0301 Fax

RESOLUTION OF THE GOVERNING BODY
OF
THE DUCKWATER SHOSHONE TRIBE

RESOLUTION NO: 2024-D-23

BE IT RESOLVED BY THE DUCKWATER TRIBAL COUNCIL, the Duckwater Shoshone Tribe (hereinafter "Tribe") is organized under the provisions of the Indian Reorganization Act of June 18, 1934, as amended to exercise certain right of home rule and to be responsible for the promotion of economic and social welfare of its tribal membership; and

WHEREAS, the Duckwater Shoshone Tribe recognizes the threat that natural hazards pose to people and property; and

WHEREAS, an adoption of the Hazard Mitigation Plan is required as a condition of future grant funding of mitigation projects; and

WHEREAS, the Duckwater Shoshone Tribe participated jointly in the planning process, with the Nye County Emergency Management Office to be included in the Nye County, Nevada, Multi-jurisdictional Natural Hazard Mitigation Plan Update (September 2023); and

THEREFORE BE IT RESOLVED, The Duckwater Shoshone Tribe is aware that revisions and updating of the plan is critical for active and effective hazard migration and the Duckwater Emergency Management Office will monitor and record hazard related data and events that can be used to update the hazard mitigation plan; and

BE IT FURTHER RESOLVED, The Duckwater Shoshone Tribe accepts to be included in the Nye County, Nevada, Multi-Jurisdictional Natural Hazard Mitigation Plan Update (September 2023), and the Chairman of the Duckwater Shoshone Tribe or the Chairman's designated authorized representative is hereby empowered to carry out the intent of this resolution.

C-E-R-T-I-F-I-C-A-T-I-O-N

The undersigned, as Chairman and Secretary of the Duckwater Tribal Council, do hereby certify that the Duckwater Tribal Council is composed of five (5) members of whom 4 were present at a meeting held on the 29th day of April, 2024 and the foregoing tribal governing resolution was duly adopted by a vote of 3 FOR, 0 AGAINST, and 0 ABSTENTATIONS: Pursuant to the authority contained under Article VI, Section 1 (a) of the Constitution and Article III, Section of the By-Laws approved November 28, 1940 as amended

Debra O'Neil, Chairman
Duckwater Shoshone Tribe

Marian Perez, Secretary
Duckwater Shoshone Tribe

Appendix C – Public Survey Data

Nye County, NV Hazard Mitigation Plan Survey

Project Engagement

VIEWS	PARTICIPANTS	RESPONSES	COMMENTS
196	28	187	96

Where in Nye County do you live?

Pahrump

6 days ago

Pahrump

6 days ago

2311 N Ambler Way

8 days ago

South Pahrump

8 days ago

Pahrump

11 days ago

Pahrump

13 days ago

Pahrump

14 days ago

Beatty

14 days ago

Pahrump

14 days ago

Pahrump

15 days ago

Pahrump

16 days ago

Duckwater, Nevada

16 days ago

Duckwater

16 days ago

Beatty

16 days ago

Beatty

17 days ago

Beatty

17 days ago

Beatty
On

17 days ago

Beatty

18 days ago

Duckwater

18 days ago

Beatty

18 days ago

beatty

18 days ago

Pahrump

19 days ago

Beatty

19 days ago

Pahrump

19 days ago

Pahrump

19 days ago

Pahrump

19 days ago

The following natural hazards have been identified as having the potential to impact Nye County. Please tell us about your concerns about the identified hazards.

	No Concern	Some Concern	Moderate Concern	Significant Concern
Dam Failure	74% No Concern	11% Some Concern	7% Moderate Concern	7% Significant Concern
Drought	- No Concern	33% Some Concern	30% Moderate Concern	37% Significant Concern
Eathquake	23% No Concern	50% Some Concern	27% Moderate Concern	- Significant Concern
Extreme Temperatures	7% No Concern	30% Some Concern	33% Moderate Concern	30% Significant Concern
Flash Flood / Flood	7% No Concern	7% Some Concern	25% Moderate Concern	61% Significant Concern
Severe Storm (including Lightning, Thunderstorms, Hail, and Wind)	4% No Concern	27% Some Concern	31% Moderate Concern	38% Significant Concern
Wildfires	8% No Concern	46% Some Concern	42% Moderate Concern	4% Significant Concern

28 respondents

Have you been impacted by any of the identified hazards in the last five years? If yes, please tell us about what happened.

I have experienced flooding of my yard several times. There is a wash that runs across my yard, the neighbors property and cuts across my street. The flooding is severe enough to cause vehicles to be trapped on the roadway and left one of my neighbors trapped on his property. The flooding on one occasion required Valley Electric to come out and reinforce their pole to keep it from falling while the flood waters were actively moving

6 days ago

My home has been flooded several times I've the last couple years. Salt cedar trees/Tamarix trees drink too much water, creating runoff conditions, trees need removal and mulching . Deep tap root trees, shrubs and grasses need to be planted along northern pahrump to allow rain water to penetrate into the ground and into the water table, restoring well water. Swales could be dug to store even more rain water, providing more habitat for endangered plant and wildlife species. Flood insurance prices have increased and flooding will happen for many of us.
Last year we were standing over 1 foot or deeper on our entire property. Previous owners moved because of the flooding. Lots can be done. Sean Johnson 7023666825
2311 ambler way pahrump nv

8 days ago

flooding of streets

8 days ago

Well Pump was replaced and lowered significantly to reach lower water levels

11 days ago

Flooding in 2021 within Zone X. 2" of flood water flow during the storm and then standing water on our property for four hours after.

13 days ago

Flooding resulting in sinkholes.

14 days ago

Any type of significant rainfall and my property floods. No type of drainage and it appears the country roads are angled to push the water onto my property.

14 days ago

No

14 days ago

Severe storms took out power, tore a hole in my roof, started malfunction with propane heater (fire); soil sinking from rains cause home to shift, got caught on highway 160 flashflood; extreme temperatures causing sickness when a/c goes out & costs too high to turn on; water shortage.

15 days ago

Experienced a power outage during the earthquake in July 2019.

16 days ago

In the summer of 2021 and 2022, the Duckwater community experienced flooding that damaged fencing and hay crops. There was some moderate damage to the events area near the tribal administration office.

16 days ago

high wind had blew off many shingles on my house

16 days ago

Smoke from wildfires makes it hard to breath. Flash Flooding and severe rain creates dangerous channels in our dirt roads, erodes the paved roads, leaves a lot of dangerous debris and cuts off roads and people from getting through. I have slipped and fallen on the pavement due to slick mud crossing the street. Severe storms caused the roof to blow off my shed with rain it caused a lot of damage. Neighbors have had their carport blown over and lost shingles on their roof. Extreme temperatures cause more power usage and those of us on fixed incomes cannot afford it.

16 days ago

Major rain storms causing problems and damage to various properties and local dirt roads because of higher rainfall than normal resulting in running water

17 days ago

no

17 days ago

I think everyone has been impacted by air quality issues from wildfires burning nearby, drought has long term concerns as to where people will be able to actually reside because of access to drinking water, flash flooding from severe storms has happened locally for two years in a row and may become the new norm as time goes on, extreme temperatures have impacts on everyone and strain natural resources as well as the resources of our emergency responders.

18 days ago

Flash floods have damaged/washed out our access roads (Hwy 379) a number of times during the last two years. This has been an ongoing problem that has not been seriously dealt with. DOT fixes it back the way it was but it keeps happening.
Weather related extremes have caused travel restrictions numerous times.
Weather related extremes have caused dangerous situations for elders within the community.

18 days ago

no

18 days ago

Yes, we experienced storms, flooding, and earthquakes.

19 days ago

NO

19 days ago

High Wind damage to property. Flood damage to surrounding roadways.

19 days ago

No

19 days ago

Are there any other hazards that were not identified that may be worth consideration for inclusion in the Hazard Mitigation Plan?

crime and lack of adequate number of Sheriffs, poor overall infrastructure including basic maintenance and building oversite

8 days ago

Already listed my concerns regarding natural disaster mitigation

11 days ago

Dust storms in the valley. The dry lake bed is notorious for causing blinding conditions during high wind events. Residents should be notified to stay inside, don't attempt to drive in those conditions. Some of our residents experience severe respiratory issues during these events. All structures are required to withstand 90+ mph wind speeds.

13 days ago

No

14 days ago

Significant amounts of hazardous waste gets trucked thru several towns though out Nye county.

14 days ago

No

14 days ago

Poor quality of water in wells serving Comstock Park area (tastes salty & poison) makes you sick

15 days ago

The extreme wind damages and topples trees causing damage to property and roads.

16 days ago

?

17 days ago

Increase in potential for industrial type man made hazardous scenarios.

18 days ago

Open range has caused responders to attend numerous vehicle accidents on the highways. This has caused health and property damage that both travelers and cattlemen have had to deal with. The roads need better, more appropriate signage.

18 days ago

no

18 days ago

pandemic preparedness

19 days ago

No

19 days ago

Limited access to areas due to single roadways for many areas. This is more part of response but it would be a serious concern, especially near some of our school sites.

19 days ago

No

19 days ago

Are there any projects that could help make safer communities in Nye County that you would like to be considered for the Hazard Mitigation Plan? (Example: construction of stormwater retention ponds or severe weather safe rooms)

flood control is number 1 our crumbling roads are #2 and a local government that is basically only open 4 days a week our town is prepared for nothing

8 days ago

Emergency rations of food/water, emergency community shelter w/cots.

11 days ago

Nye County is currently working with FEMA to determine the best locations for retention basins. We have grants in place to capture data and revise our current FIRMs. DEM needs to work more closely with the Floodplain Administrator and Public Works that are actually monitoring the grants.

13 days ago

Retention ponds and large crosstown water corridors or open storm sewers

14 days ago

Storm water drainage and retention basins would be a great idea. The county does have more towns than just Pahrump and Tonopah to spend our taxes dollars on.

14 days ago

Storm water detection basins to hold flash flood waters, severe weather safe rooms good idea to and coming stations

15 days ago

Yes, definitely, stormwater containment ponds, upgrade to stormwater culverts, alternate power sources when storms cause power outages.

16 days ago

Repaving roads for stability. Creating gutters for water to get to the storm drains. Larger and more storm drains and larger area to hold the runoff water.

16 days ago

Clean out the Amargosa River bed from just upstream from the Stagecoach Casino all the way down to US95 by Vanderbilt Road.
By doing this it will water flow restrictions such as the high number of various sized trees and brush allowing a much better flow of large amounts of running water and potentially reduce significant property damage
Currently there are 3 motels that can be washed out with flood waters which WILL result in the loss of many lives. Two of them, the Stagecoach Casino Motel and Motel 6, are upstream of the US95 bridge in Beatty and the Atomic Inn just downstream from same bridge.
IMMEDIATE concerns should be shared by Nye County officials

17 days ago

more trees

17 days ago

More training for first responders for experience working with the State and County at different level of emergency's. Ensure each community has an emergency action plan that they know about and have the opportunity to run through scenarios with all the individuals that would potentially have a role, for setting up a shelter and communicating to the community the availability of access to a facility should an emergency happen.

18 days ago

Currant and Duckwater communities have little to no help coming from the county when there is an emergency. The distance makes it difficult for resources to arrive in the the time needed to address the issue. Local residents are left to handle things on their own and there is no acknowledgement or remuneration from the county. Outlying residents and communities, though low in numbers, are just as important as those who live closer to county resources. They should be treated with equal respect and response.

18 days ago

Highway culverts

18 days ago

no

18 days ago

better flood control.

19 days ago

no

19 days ago

None known at this time. Would like to say very impressed with the amount of response for such a small community. Thank you!!

19 days ago

Storm water retention ponds, redirection of water runoff from mountains. Cooling stations.

19 days ago

Is there anything else concerning Hazard Mitigation that you would like us to know?

there appears to be no rhyme or reason to what is allowed in Pahrump, all this growth with poor infrastructure/services will not end well

8 days ago

The public needs to be given more information on the radio, television station and with community engagement events on how to prepare for a disaster. In addition, a public reminder to not call 911 and tie up phone lines/dispatchers for trivial questions, especially during an emergency event.

11 days ago

The public needs to be given more information on the radio, television station and with community engagement events on how to prepare for a disaster. FEMA provides quite a bit of informational handouts, in all languages, on how to prepare for an emergency.
Our First Nation residents in the northern part of the County need more assistance and to be recognized as partners with Nye County. They were inundated with flood waters and left stranded. The County can do better.

13 days ago

Looks like it has already been said but maybe you should also work on hazard remediation since roads are still in horrible condition from the last few rain falls.

14 days ago

No

16 days ago

It has been over a month since the last storm. I have yet to see anyone here to clean or inspect the streets. There are still areas where the road was washed out and the Amargosa river is running across it. There are still areas full of dried-up mud and silt that if rained on again become very slick and dangerous.

16 days ago

?

17 days ago

The recent hurricane event was a new one for the County but I think they handled it well. Early involvement and coordination within the County really makes a difference.

18 days ago

Low populations numbers in a given area should not mean a lower priority of response and assistance. When something happens in one of these low population density areas there is usually never a county response, even when the larger population areas are not as affected. The county EM office needs a position or job description that is tasked with reaching out to outlying areas to check for response needs. It should not just be residents who have to deal with their own response problems and then take time to try to contact the appropriate county office for a long delayed response.

18 days ago

No

18 days ago

no

18 days ago

no

19 days ago

no

19 days ago

No.

19 days ago

Appendix D – Critical Facilities

Emergency Operations Centers		
Nye County Emergency Operations Center	1510 Siri Lane	Pahrump, NV 89060
Alternate Emergency Operations Center (Beatty Ambulance Hall)	319 Hoyt Street	Beatty, NV 89003
Alternate Emergency Operations Center (Tonopah Fire Department)	209 N St. Patrick Street	Tonopah, NV 89049
Law Enforcement Facilities		
Sheriff's Office Substation	101 Radar Road	Tonopah, NV 89049
Sheriff's Office Substation	855 Farm Road	Beatty, NV 89003
Amargosa Substation	123 S. Center Street	Amargosa Valley, NV 89020
Gabbs Substation	503 Brucite	Gabbs, NV 89409
Smoky Mountain Substation	85 Hadley Circle	Round Mountain, NV 89045
Sheriff's Office Headquarters	1520 E. Basin Road	Pahrump, NV 89060
Mercury Substation	Nevada National Security Site	Mercury, NV 89023
Fire Departments		
Pahrump Station 1	300 N Highway 160	Pahrump, NV 89060
Pahrump Station 3	3650 E Kellogg	Pahrump, NV 89048
Pahrump Station 4	3030 W Bell Vista	Pahrump, NV 89060
Pahrump Station 5	461 E Harris Farm Road	Pahrump, NV 89060
Amargosa Valley VFD (Station 41)	851 E Farm Road	Amargosa Valley, NV 89020
Beatty VFD (Station 31)	451 N. 3rd Street	Beatty, NV 89003
Beatty VEMS	317 W. Hoyt Street	Beatty, NV 89003
Belmont CERT (Station 81)	#1 Main Street	Belmont, NV 89022
DEM Logistics Storage	115 Saddle	Crystal, NV 89020
Duckwater/Currant Creek Fire Department (FD91/92)	P.O. Box 140068	Duckwater, NV 89314
Manhattan VFD (Station 61)	100 Main Street	Manhattan, NV 89022
Smoky Valley/Round Mountain VFD (Station 21)	103 Smoky Valley Road	Smoky Valley, NV 89045
Smoky Valley/Round Mountain VEMS (Station 21)	53642 State Hwy 376	Smoky Valley, NV 89045
Tonopah VFD (Station 11)	209 N St. Patrick Street	Tonopah, NV 89049
Tonopah VEMS (Station 11)	209 N St. Patrick Street	Tonopah, NV 89049
Governmental Buildings		
County Administrative and Governmental Offices	101 Radar Road	Tonopah, NV 89049
County Administrative and Governmental Offices	2100 E. Walt Williams Dr	Pahrump, NV 89048
Utility Infrastructure		
Valley Electric Association	800 E. Highway 372	Pahrump, NV
Great Basin Water Company	1240 E State Street	Pahrump, NV 89048
Desert Utilities Inc.	4060 N Blagg Road #110	Pahrump, NV 89060
Pahrump Utility Company	5250 Hafen Ranch Road	Pahrump, NV 89061
Beatty Water and Sanitation District	1300 North A Avenue	Beatty, NV 89003
Tonopah Public Utilities	102 Burro Avenue	Tonopah, NV 89049
Hospitals		
Desert View Hospital	360 Lola Lane	Pahrump, NV 89048