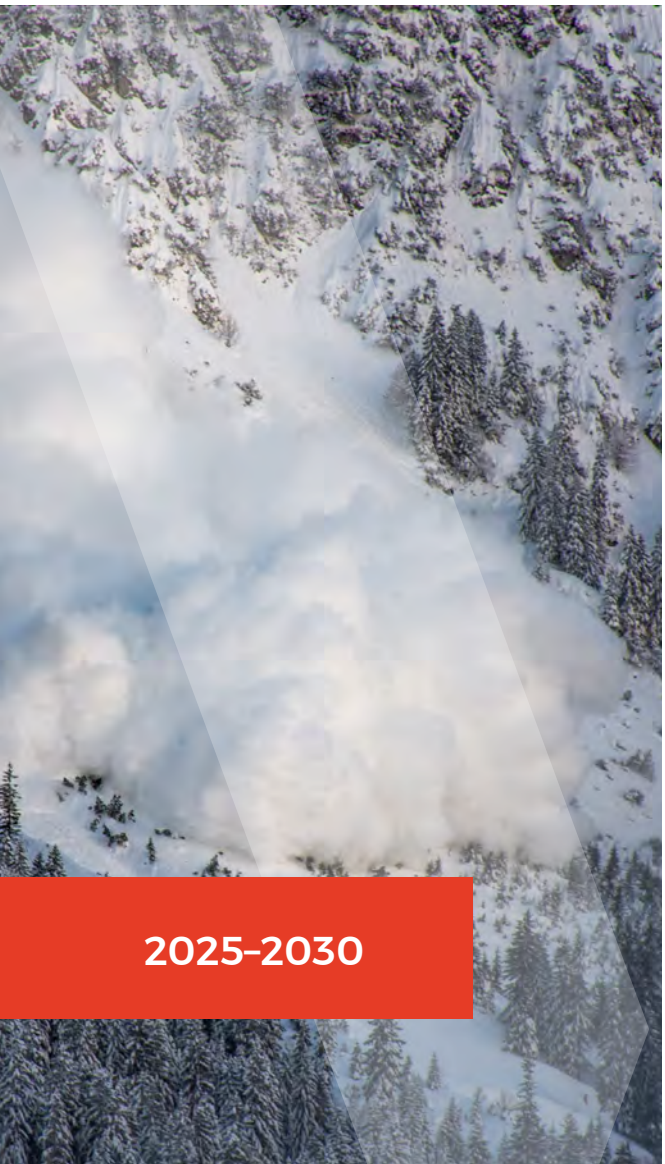
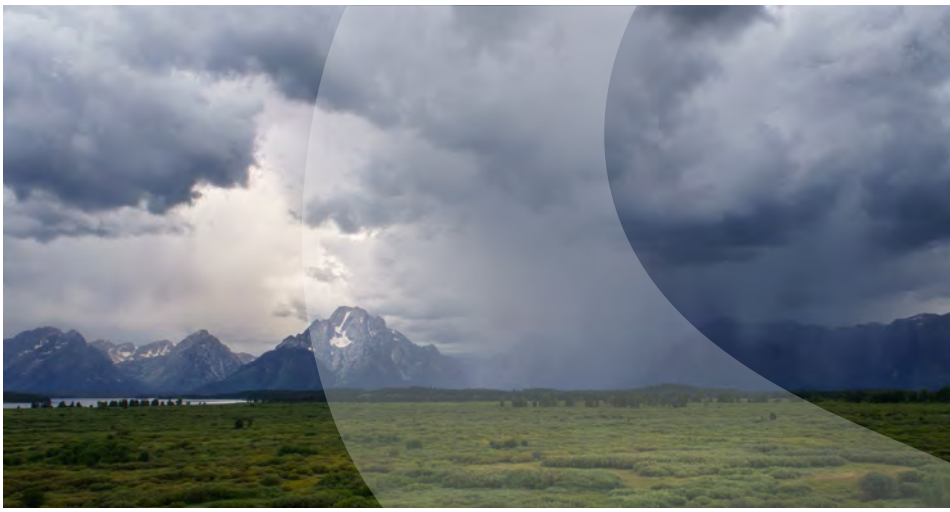
Wyoming Region 8
Regional Hazard Mitigation Plan

for **Teton County**





2025–2030

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1 Introduction

1.1 Purpose

This plan is the 5-year update of the Wyoming Region 8 Hazard Mitigation Plan (HMP). The revision was completed in 2024 and will be effective for 2025-2030. Wyoming Region 8 (Region) has prepared this HMP to guide hazard mitigation planning to better protect the people and property of the Region from the effects of hazard events. The encompassing and participating jurisdictions include Teton County and the Town of Jackson, Teton Conservation District, Flat Creek Watershed Improvement District, and the Jackson Hole Airport. The purpose of this HMP is to identify policies, actions, and strategies that will help to reduce risk and prevent future losses. Hazard mitigation is best realized when community leaders, businesses, citizens, and other stakeholders join together to undertake a process of learning about hazards that can affect their area and use this knowledge to prioritize needs and develop a strategy for reducing damage. Hazard mitigation is most effective when it is based on a comprehensive long-term plan developed prior to a disaster or hazard event and considers both previous occurrences and future conditions.

This plan demonstrates the Region's commitment to reducing risks from hazards and serves as a tool to help decision-makers direct mitigation activities and resources. This plan was developed to ensure that Wyoming Region 8 and the participating jurisdictions qualify for federal disaster assistance, particularly from the Federal Emergency Management Agency (FEMA). This includes access to Hazard Mitigation Assistance (HMA) grants, such as the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), and the Building Resilient Infrastructure and Communities (BRIC) program. Additionally, the plan aims to strengthen the participating jurisdictions' resilience to disasters and demonstrates the Region's commitment to reducing risks from hazards and serves as a tool to help decision-makers direct mitigation activities and resources.

1.2 Background and Scope

Each year in the United States, disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. However, this financial support only covers part of the total cost, as additional expenses incurred by insurance companies and non-governmental organizations are not reimbursed by taxpayers. Many disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated in advance.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $6 in avoided future losses in addition to saving lives and preventing injuries (Natural Hazard Mitigation Saves, 2019 Report).

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are developed, prioritized, and implemented. This plan documents the planning region's hazard mitigation planning process, identifies relevant hazards and risks, and identifies the strategies that each participating jurisdiction will use to decrease vulnerability and increase resiliency and sustainability.

This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002 (44 CFR §201.6) and finalized on

October 31, 2007 and updated in 2012 (hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA 2000). On April 19, 2022 FEMA updated the State and Local Mitigation Policy Guides (policies). On April 19, 2023 they went into effect. This means that all state and local plans must meet the updated requirements. While the DMA 2000 emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because the planning area is subject to many kinds of hazards, access to these programs is vital.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and property owners by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption. The jurisdictions in the planning area have been affected by hazards in the past and are committed to reducing future disaster impacts and maintaining eligibility for federal funding.

1.3 Plan Organization

The Wyoming Region 8 Regional Hazard Mitigation Plan is organized in alignment with the DMA 2000 planning requirements and the FEMA plan review crosswalk:

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

1.4 Multi-Jurisdictional Planning

This plan covers Wyoming Region 8, which is one of eight homeland security planning regions designated by the Wyoming Office of Homeland Security (WOHS). Teton County is the only county within Region 8 and The Town of Jackson is the only incorporated community within Teton County. These two jurisdictions participated in and adopted the original Plan in 2004, and the pursuant updates in 2012, 2016, and 2020. Consistent with the 2020 update, this Plan includes the Teton Conservation District as a participating entity, with the Flat Creek Watershed Improvement District (FCWID) and the Jackson Airport Board (Airport) joining as new participating entities. Participation from Teton County, the Town of Jackson, the Teton Conservation District, the FCWID, and Airport took place in several ways, including:

- Providing key staff to participate in the Local Emergency Planning Committee (LEPC) meetings which served as the Hazard Mitigation Planning Committee (HMPC) for this update;
- Issuing news releases to staff and community members throughout the planning process;
- Posting project and community engagement information on websites, newsletters, and other outlets;
- Identifying actions taken on mitigation actions from the 2020 plan update;
- Providing information through a plan update guide on existing capabilities, hazard concerns, and related plans and documents;

- Providing data for GIS mapping and other risk assessment tasks;
- Providing contacts from which to obtain critical information;
- Providing feedback on plan drafts; and
- Adopting the plan once FEMA approval has been obtained.

Chapter 3 contains additional details on the planning process used to prepare the update of this plan in 2024.

2 Community Profile

This section provides a brief overview of the geography of the planning area. Additional geographic profiles of the participating jurisdictions are provided in the county annexes.

2.1 Geography and Climate

Wyoming Region 8 is comprised of Teton County in the northwest corner of Wyoming, covering an area of 4,216 square miles (10,920 km²). It is renowned for its mountain scenery, including the Teton Range, which gives the county its name. The county is home to two national parks: Grand Teton National Park in its entirety and 40.4% of Yellowstone National Park's total area.

The county seat and the only incorporated town in Teton County is Jackson, which serves as a gateway to both national parks. Other communities in the county include Alta, Hoback, Kelly, Teton Village, and Wilson. The region's economy is primarily supported by tourism, with millions of visitors drawn to the area each year for outdoor activities such as hiking, skiing, fishing, and wildlife viewing.

Geographically, Teton County is characterized by mountainous terrain and geologically active features. The highest point in the county is Grand Teton at 13,775 feet (4,199 m), while the lowest areas are around 6,000 feet (1,829 m) in elevation. The Snake River is the major waterway flowing through the county.

The climate in Teton County is characterized by long, cold winters with deep snow and short, dry, cool summers. Average winter temperatures can drop below 0˚F (-18˚C), while summer daytime temperatures typically range from 70-80˚F (21-27˚C). The area receives an average of 150-400 inches (381-1,016 cm) of snowfall annually, depending on elevation.

U.S. Highway 89 is a critical north-south corridor running through Teton County, serving as the main route for travelers heading to Grand Teton National Park from both the southern and northern directions. It intersects with U.S. Highway 191, another important route that provides access to the parks and supports local traffic. Wyoming Highway 22 connects Jackson with Teton Pass, serving as a key commuter route for Idaho residents and offering scenic access to recreational areas. Similarly, Wyoming Highway 390 leads to Teton Village, a well-known destination for skiing and outdoor activities. Additionally, U.S. Highway 26 traverse Togwotee Pass, connecting the Jackson area to central Wyoming. This route is essential for year-round travel, providing access through mountainous terrain and serving as a critic al transportation link for tourism, commerce, and emergency services in the region.

Public transportation in Teton County is primarily provided by the START Bus, which operates routes throughout Jackson and surrounding areas. The service is free within Jackson but requires fares for routes to Teton Village and other nearby locations such as Star Valley and Teton County, Idaho. During the summer months, the Alltrans Shuttle Service provides transportation to Idaho and Utah, including some airports. There is currently no public transit service connecting Jackson to Grand Teton or Yellowstone National Parks. Numerous private companies offer guided tours in the parks in both winter and summer.

The Jackson Hole Airport (JAC), located within Grand Teton National Park, is the primary airport serving Teton County and is a key entry point for tourists. Jackson Hole Airport is among the busiest airports in Wyoming. Additionally, Idaho Falls Regional Airport (IDA) and Salt Lake City International Airport (SLC) offer alternative access, with shuttle services available to Jackson. Highway 22 is not designed to fully accommodate the needs of both local residents and the seasonal influx of tourists in Teton County. While it serves as a vital commuter route, particularly for residents traveling from Idaho, it is not equipped to handle the substantial traffic demands during peak tourism season. The infrastructure limitations of Highway 22 can

lead to congestion and delays, impacting both everyday travel and the overall efficiency of the transportation network during high-demand periods. This system also helps manage traffic challenges in a rapidly growing area.

As of the 2020 census, Teton County had a population of 23,331. The county is notable for its high property values and wealth concentration, which has led to challenges in maintaining affordable housing for lower and middle-income residents. Additionally, the county is known for its commitment to preserving its natural and cultural heritage, with over 97% of its land under federal or state ownership.

A base map of the planning region is illustrated in Figure 2-1. Details of land type and ownership can be found in Table 2-1.

Figure 2-1 Wyoming Region 8 Planning Area Map

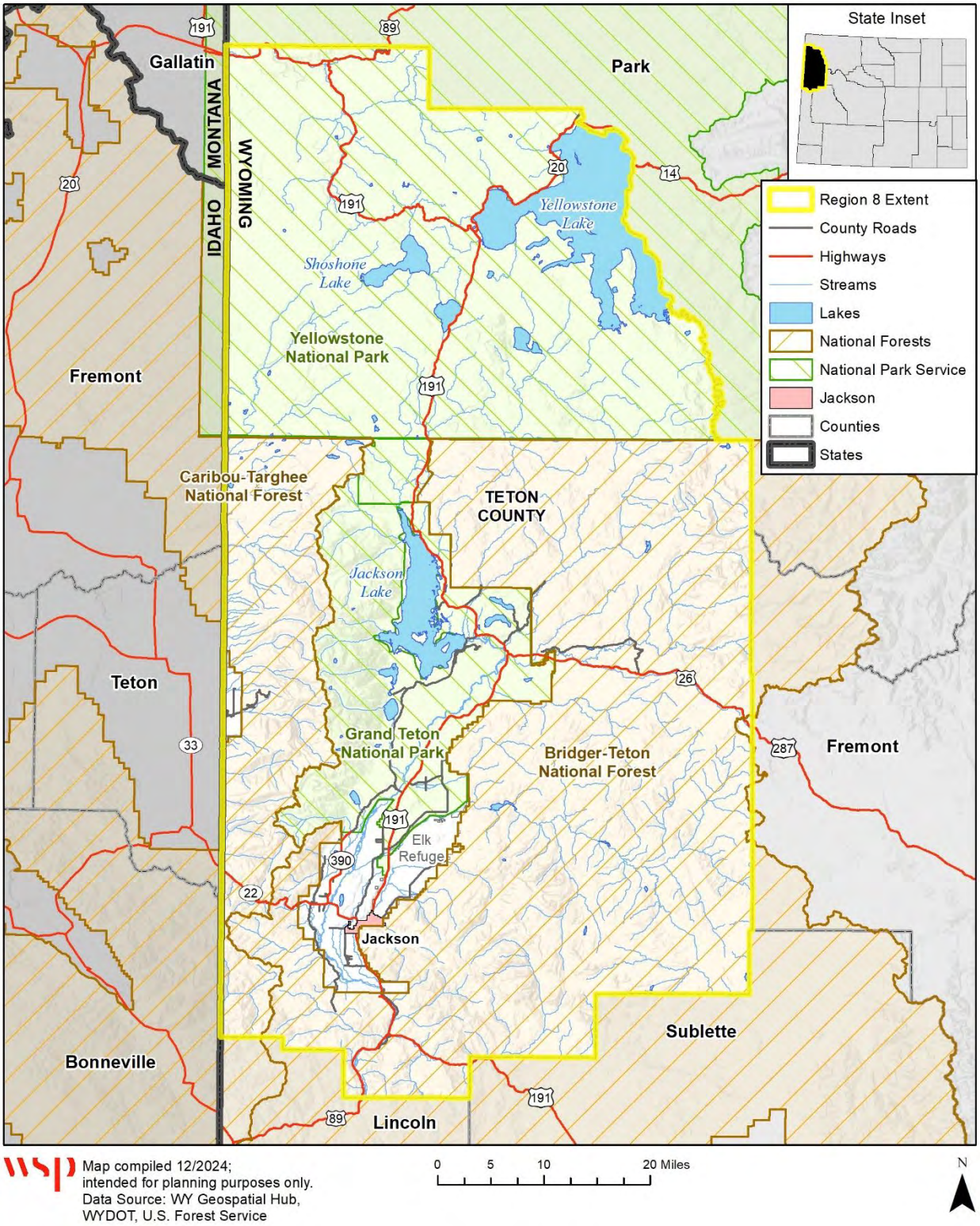


Table 2-1 Region 8 Land Ownership

LAND OWNERSHIP	ACREAGE	PERCENTAGE
Bureau of Land Management	2,452	0.09%
Bureau of Reclamation	9,279	0.34%
Fish and Wildlife Service	24,869	0.92%
Forest Service	1,363,299	50.45%
National Park Service	1,222,302	45.23%
City, County, Private, Other	80,009	2.96%
Total	2,702,208	--

Source: Teton County, ArcGIS Living Atlas of the World – USA Federal Lands, WSP GIS Analysis

2.2 Population

Table 2-2 describes the population distribution and change for the Region. Table 2-3 shows how the region's population has changed since the 2010 Census. As a whole, the Region increased in population by just under 10%, well above the state's overall growth of 3%.

Table 2-2 Region 8 Population Distribution

JURISDICTION	2020 CENSUS POPULATION	2022 ACS ESTIMATED POPULATION	% OF REGION TOTAL
Teton County	23,331	23,346	100
Region 8 Total	23,331	23,346	---

Source: US Census Bureau Decennial Census, ACS 5-Year Estimates 2022

Table 2-3 Region 8 Population Change 2010-2022

JURISDICTION	2010 CENSUS	2015	2022	% CHANGE
Teton County	21,294	22,311	23,346	9.64%
Region 8 Total	21,294	22,311	23,346	9.64%

Source: US Census Bureau Decennial Census, ACS 5-Year Estimates 2015 and 2022

Table 2-4 Region 8 Demographic Profile

CHARACTERISTIC	REGION 8
Population estimate	**23,346**
AGE AND SEX	
Median Age	**39.9**
Percent of population under 18	**17.6%**
Percent of population 65 and over	**16.6%**
Percent of population male	**51.9%**
Percent of population female	**48.1%**
Race and Ethnicity	
White alone	**79.7%**
Black or African American alone	**0.6%**
American Indian alone	**0.1%**
Asian alone	**1.3%**

CHARACTERISTIC	REGION 8
Native Hawaiian & Other Pacific Islander alone	**0.1%**
Some other race alone	**2.3%**
Two or more races	**0.6%**
Hispanic or Latino (of any race)	**15.2%**
Education	
High school graduate or higher, age 25 years+	**96.0%**
Bachelor's degree or higher, age 25 years+	**60.3%**
Vulnerable Populations	
Percent of population under 5 years old	**4.1%**
Percent of population 85 years and older	**1.2%**
Percent of population that speak English less than "very well"	**7.1%**
Percent of population with disabilities	**5.7%**
Percent of population without health insurance	**11.9%**
Percent of population in poverty	**6.9%**
Percent of population in deep poverty (<1/2 federal poverty level)	**2.6%**
Percent of population over 65 and in poverty	**1.3%**

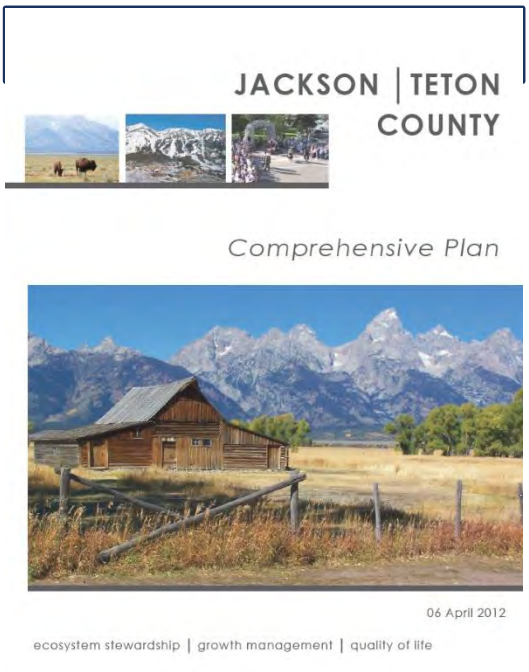
Source: U.S. Census Bureau, American Community Survey, 2022 5-Year Estimates
*Hispanic or Latino is considered an ethnicity, not a race. People who identify as Hispanic or Latino can belong to one or more races. Therefore, the total percentage can be greater than 100%.

2.3 Changes in Development

Despite its limited available land and annual influx of visitors, the county works hard to manage growth in a manner that maintains its western heritage and supports the natural resources that contribute to the local economy and provide quality of life for its residents. The Jackson/Teton County Comprehensive Plan, adopted in 2020 as a joint Town/County project after a five-year public engagement process, sets a combined vision for both government entities based on the following three common values.

- **Ecosystem Stewardship**: Protect the ecosystem's health, including native species, water, and climate, by preserving critical habitat, minimizing the impact of development on wildlife and water quality, and reducing local contributions to climate change. The goal is to preserve the environment for future generations, recognizing its importance for community well-being.
- **Growth Management**: Direct growth to areas with minimal environmental impact, using existing infrastructure to avoid habitat loss and maintain community character. Focus on balancing development needs with ecological preservation.
- **Quality of Life**: Promote diverse housing, economic opportunities for all, and alternative transportation. Ensure access to essential services, healthy living environments, and support individual and community well-being.

These values are analyzed annually in an "Indicator Report" to determine whether growth and development that is occurring is happening in a manner and in the locations that align with the stated values. The Indicator Report measures change and growth utilizing several metrics, the most important of which have become known as the 60/40 and 65% goals, which are described in more detail below.



The Comprehensive Plan sets a goal for 60% of all growth to occur within "Complete Neighborhoods," meaning areas with existing development and services. This target supports the community's three core values. Ecosystem Stewardship is upheld by directing development away from wildlife habitats, scenic areas, and open spaces. Growth Management is achieved by focusing development where infrastructure and services are already available. Quality of Life is enhanced by placing homes near jobs, services, and community spaces, which promotes energy efficiency and fosters a stronger sense of community.

The plan also sets a 65% target for local workforce residency. This goal supports Ecosystem Stewardship by reducing emissions and wildlife-vehicle collisions from commuting. It advances Growth Management by ensuring that housing demand is met locally rather than shifting development to other areas of the ecosystem. Finally, it enhances Quality of Life by enabling local workers to live in Jackson or nearby Complete Neighborhoods, where they can contribute to the community by volunteering, supporting local businesses, raising families, responding to emergencies, and engaging in civic life.

The following statistics are provided in the 2023 Annual Indicator Report.

Ecosystem Stewardship

- The community has prioritized preserving its ecosystem, with 97% of Teton County being public land. Since 2012, there has been a net gain of 515 acres conserved compared to developed land in rural areas.
- Greenhouse gas emissions have not decreased below 2012 levels, indicating that more action is needed to meet sustainability goals.

Growth Management

- The community's goal is to direct growth out of rural areas of habitat, scenery, and open space and into complete neighborhoods of infrastructure, amenities, and vitality.
- The goal is to direct at least 60% of growth into Complete Neighborhoods. In 2022, this goal was not met for the first time since 2017, with less than 60% of growth occurring in these areas. This is because 2022 also saw the lowest amount of residential growth since 2017. This drop is not expected to be the start of a new downward trend, with 2023 beginning with a very strong uptick in new development.
- The location of growth potential (defined as buildout minus what is already built) forecasts where future growth will occur based on remaining allowances. The community has also set a policy not to increase buildout – the maximum amount of development permitted throughout the community. Through various measures and initiatives, the community has successfully increased the allowed number of potential residential units by 2,034 since 2012. Those 2,034 units are considered the remaining "pool" of incentive units, to be utilized for needs such as workforce housing.

Workforce Housing

- There remains a significant shortage of workforce housing, despite efforts leading to 82% of units permitted being designated for workforce or affordable housing.
- The number of units in the workforce housing pipeline has reached an all-time high, with 395 units permitted, reflecting a shift towards creating more affordable options within Complete Neighborhoods.

Housing Affordability Challenges

- Home prices have surged by 48% per year since 2019, making ownership increasingly unaffordable relative to median income levels.
- Rents have also increased by 5% per year, further straining affordability for residents.

Economic Trends

- Per capita income has been growing at over 5% per year since 2008, but the pandemic has exacerbated disparities in housing affordability due to shifts in job types and income distribution.
- The community's wealth growth has been significant since 2002, highlighting an ongoing trend that impacts housing and economic conditions.

In summary, while there have been successes in conservation and directing growth into Complete Neighborhoods, challenges remain, particularly in housing affordability and greenhouse gas emissions. The community's ongoing efforts in workforce housing and ecosystem stewardship are critical as they work towards achieving their long-term vision and sustainability goals.

2.3.1 Development Since 2019 Regional HMP

- In the Town of Jackson, development has been focused on the redevelopment of existing properties and infill of a few vacant or underutilized areas.
- There has been a modest increase in residential development in hillside neighborhoods and steeper lots as the remaining lots are being developed.
- No known hazard problems have occurred with these developments, which are primarily single-family homes.
- Some redevelopment has occurred along Flat Creek (within the Town of Jackson and Flat Creek Watershed Improvement District), the primary flood hazard zone, but with either a 25-foot or 50-foot development setback from the creek, much of this hazard has been mitigated. Additionally, Flat Creek has not presented a significant flood hazard risk, apart from frazil ice in the winter.
- New development in the unincorporated areas and Teton Conservation District is restricted by limited private land and has not noticeably increased or decreased hazard vulnerability since the last plan was approved.
- No changes in development have occurred in hazard prone areas impacting the Jackson Hole Airport.

2.3.2 Major Projects Since 2019 Regional HMP

- The Growth Management Program was triggered in 2016 when residential growth exceeded 5% since the adoption of the Comprehensive Plan in 2012. The Growth Management Program (GMP) was a quantitative review program required by the

Comprehensive Plan at 5% residential growth. It was intended to use data presented in the Annual Indicator Report and other sources to evaluate whether the community was meeting the goals outlined in the Comprehensive Plan. The GMP also provided an opportunity to pause and assess whether the community's vision, values, principles, or policies had changed, allowing for adjustments to the implementation strategies accordingly. The update to the Comprehensive Plan was adopted in 2020.

- The 2024 Housing Supply Plan was prepared by the Housing Department to analyze progress meeting goals in the Housing Action Plan and Comprehensive Plan as well as identify corrective actions and new projects. It was approved on March 4, 2024.
- The Town of Jackson rezoned the Town Square Character District to align with the desired future character outlined in the Comprehensive Plan. Although the plan was completed in 2020, it has not yet been fully implemented.

Major projects that are upcoming or underway include:

- The County is updating the Natural Resources Regulations, which protect water bodies, wetlands, and wildlife habitat from the impacts of development. The community's goal is that only 40% of new development occurs in wildlife habitat. Achieving this goal will help protect the area's natural resources; however, there will still be a need for new development to minimize and mitigate its impacts. A draft update was released on September 5, 2024.
- The Town Parking Management Study will create a complete parking strategy that balances the community's goals for land use, transportation, and Town operations. It implements the Integrated Transportation Plan and the 2012 Comprehensive Plan and updates the 2003 Downtown Parking Study. As of 2024, phases one and two have been complete (*Commercial and Residential Areas Outside of the Downtown Core* and *Downtown Core (Downtown Parking Management Plan)*, respectively). Phases three and four remain (*Corridor Parking (Regional Corridor Parking Management Plan)* and *Communitywide TDM Scoping (Communitywide TDM Plan)*, respectively).

2.3.3 Future Development

Strong future growth in both commercial and residential development, particularly affordable housing, is anticipated over the next 10 years. This growth will be concentrated in downtown commercial zones, highway commercial zones, and high-density residential areas. Additionally, development is expected in the Northern South Park area, which is in Teton County but directly adjacent to the Town of Jackson.

The zoning map, Figure 2-2 below, indicates where growth is most likely to occur, particularly in the purple, pink, and red zones. The Town does not have extensive areas of 100-year or 500-year floodplain that is undeveloped, so new development in such areas is not expected to be significant. However, there are some opportunities for redevelopment or remodeling of homes and businesses within those zones. Wildfire remains a concern, with a number of properties, mostly single-family residences, located in the Wildland-Urban Interface (WUI). Some of these properties are vacant, while others may be redeveloped, as shown on the WUI map, Figure 2-3. The HMPC noted that preliminary presentations on the proposed expansion of the Wildland-Urban Interface (WUI) have been given to the County Commission and Town Council. However, no formal votes have been taken or approvals granted as this stage.

In the Town of Jackson, development in the last 5 years has been focused on redevelopment of existing properties and infill of a few vacant/underutilized properties. Residential development has gradually increased in hillside neighborhoods and on steeper lots as the final parcels are being developed. To date, these developments, mostly consisting of single-family homes, have

not encounters significant hazard-related issues. Some redevelopment has occurred along Flat Creek, which is considered the primary flood hazard zone in the area. However, with established 25-foot or 50-foot setbacks from the creek, much of the associate flood risk has been mitigated. Additionally, Flat Creek has not been identified as a high flood risk area, aside from occasional issues with frazzle ice during the winter months.

Projected future growth and development in the Town of Jackson is expected to be strong, particularly in both commercial and residential sectors, with a focus on affordable housing over the next 10 years. This growth will be concentrated in the downtown commercial zones, highway commercial zones, and high-density residential zones. Additionally, development is planned for the Northern South Park area, which is technically in Teton County, but it is directly adjacent to the Town of Jackson. The zoning map below highlights the primary growth areas in purple, pink, and red zones.

In terms of hazard areas and vulnerability, the Town does not have extensive areas within the 100-year or 500-year floodplain. Therefore, new development is not anticipated to occur in these floodplains. However, there may be some new opportunities for redevelopment or remodeling of homes and businesses within these zones. Wildfire risk remains a concern, as several properties, mostly single-family homes, are located in the Wildland-Urban Interface (WUI). Some of these properties are vacant, while others are redeveloped, as indicated in the WUI map below. Thus, while the planning area expects continued growth, special attention will be needed in the WUI and potential redevelopment area within the floodplains to mitigate hazards and vulnerability.

Figure 2-2 Zoning Map with Areas of Likely Growth

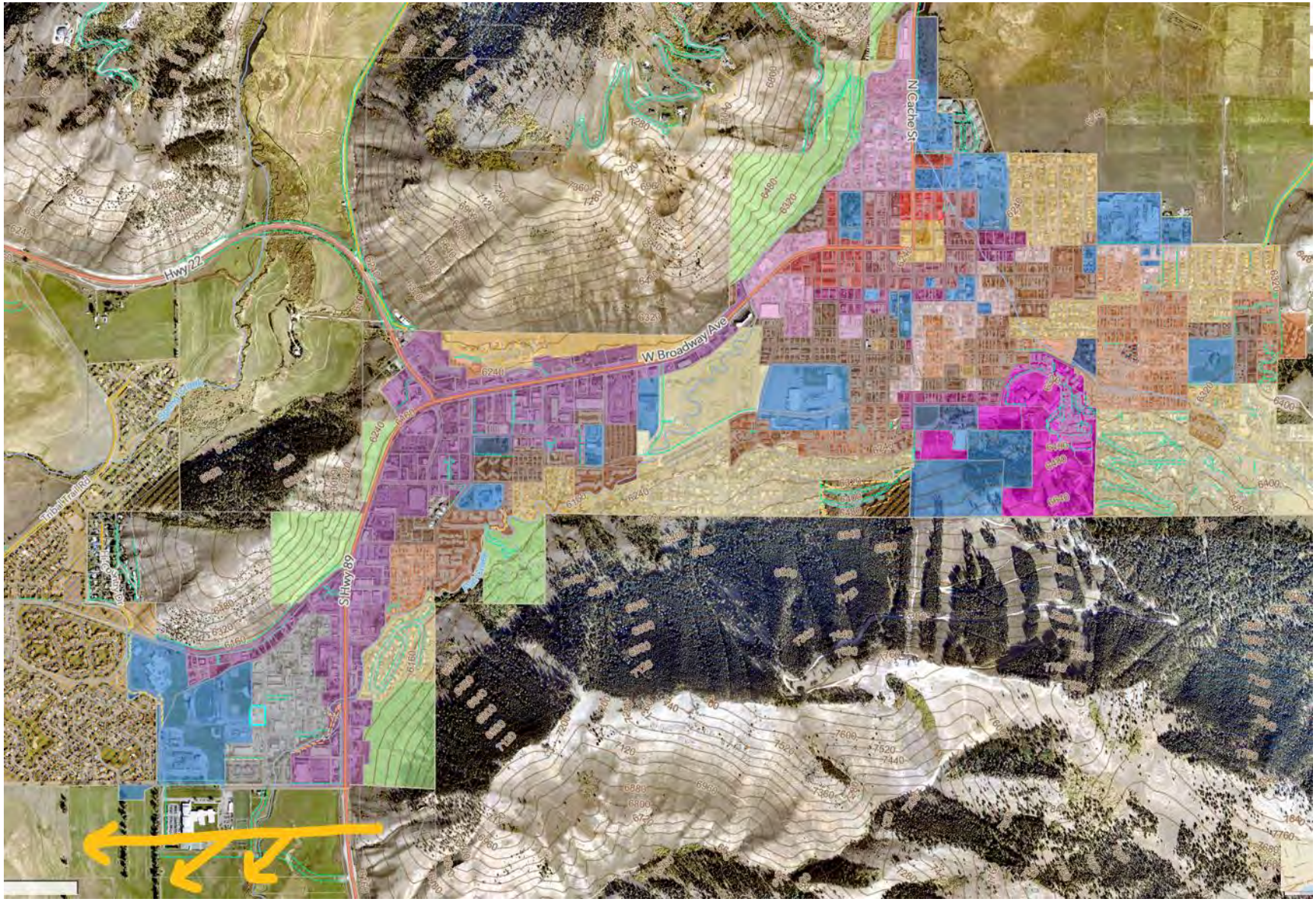
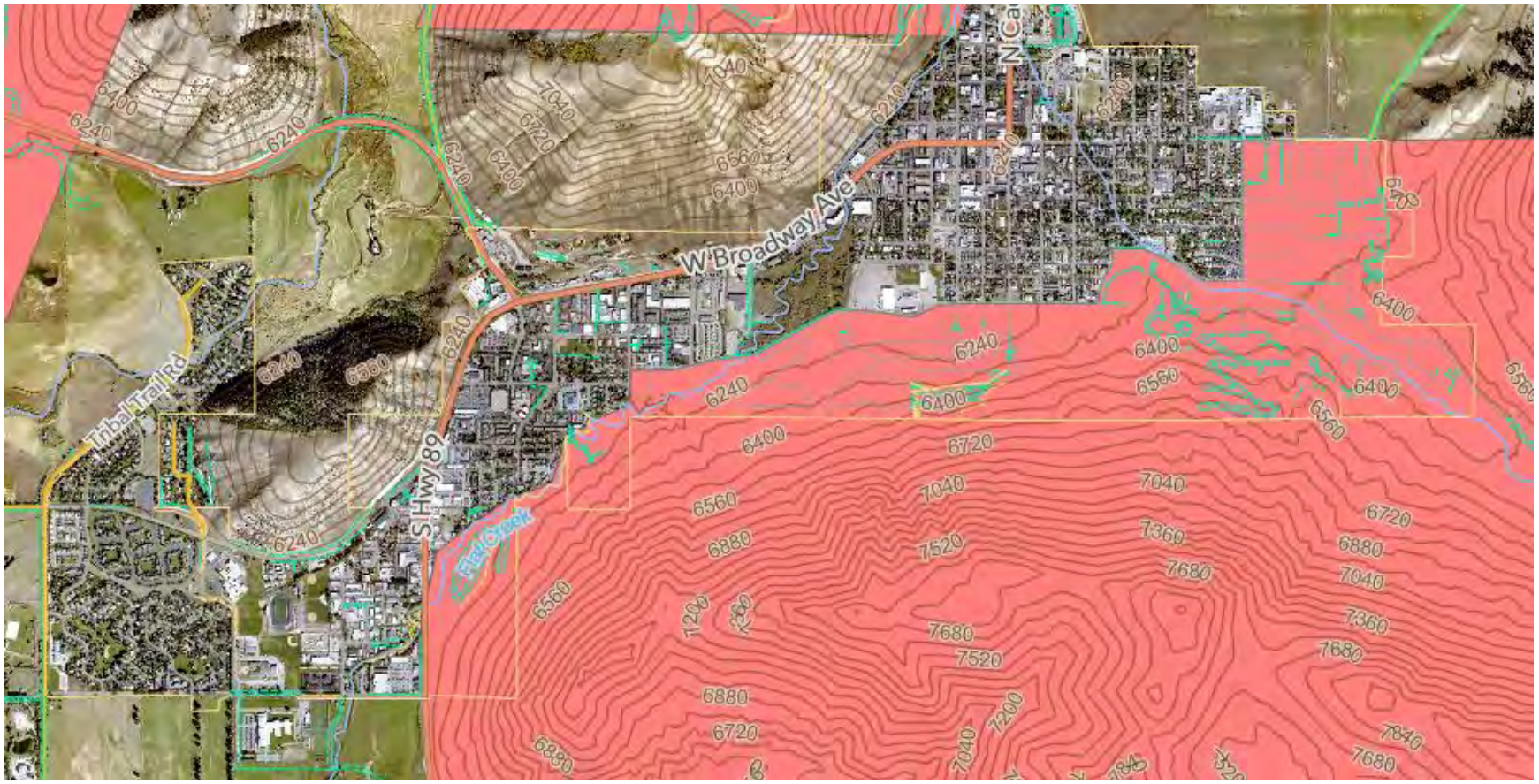


Figure 2-3 WUI Map



2.4 Economy

According to the U.S. Census Bureau, Region 8 has a dynamic economic profile. Approximately 20% of its workforce is involved in the arts, entertainment, recreation, and accommodation industry, followed by 18% in the educational services, health care assistance, and social assistance industry, and 15% in the retail trade industry. Additionally, 46% are in management, business, science, and arts occupations, while 24% are in service occupations.

The region experienced a 32% increase in total paid employees from 2000 to 2020, followed by an additional 7% increase between 2020 and 2022. Starting from a 2.3% unemployment rate in 2000, the region experienced a gradual decrease to 2.1% in 2008. The impact of the Great Recession briefly pushed the rate to 8.3%. The rate of unemployment then steadily fell following the Great Recession, hitting 2.8% in 2018, before spiking due to COVID-19 to 5.9%. It has since fallen to 1.6%, roughly half of the national average.

The region's median household income stands at $108,279, well above the national average of $75,149. Approximately 6.9% of the population falls below the poverty line, well below the national average of 12.5%.

Table 2-5 Region 8 Economic Profile

CHARACTERISTIC	REGION 8
Employment	
Total employment	15,156
Unemployment rate	1.6%
Per capita income	$76,296
Population % change, 2010-2020	9.6%
Persons in poverty	6.9%
Families in poverty	3.8%
Employers	
Total employer establishments	2,370
Total annual payroll	$1,227,465,000
Total employment	19,880
Employment growth, 2020-2022	8.3%
Employment By Industry	
Agriculture, forestry, fishing and hunting, and mining	2.7%
Construction	8.5%
Manufacturing	1.5%
Wholesale trade	1.3%
Retail trade	15.1%
Transportation and warehousing, and utilities	2.7%
Information	3.0%
Finance and insurance, and real estate and rental and leasing	7.1%
Professional, scientific, and management, and administrative and waste management services	13.5%
Educational services, and health care and social assistance	17.5%
Arts, entertainment, and recreation, and accommodation and food services	19.8%
Other services, except public administration	5.3%

CHARACTERISTIC	REGION 8
Public administration	2.2%
Employment By Occupation	
Management, business, science, and arts occupations	46.1%
Service occupations	23.7%
Sales and office occupations	17.9%
Natural resources, construction, and maintenance occupations	5.8%
Production, transportation, and material moving occupations	6.4%
Class of Worker	
Private wage and salary workers	77.2%
Government workers	13.0%
Self-employed in own not incorporated business workers	9.8%
Unpaid family workers	0.0%
Household Income	
Less than $10,000	1.9%
$10,000 to $14,999	2.1%
$15,000 to $24,999	5.9%
$25,000 to $34,999	3.2%
$35,000 to $49,999	5.2%
$50,000 to $74,999	14.8%
$75,000 to $99,999	13.4%
$100,000 to $149,999	19.3%
$150,000 to $199,999	11.7%
$200,000 or more	22.4%
Median household income	$108,279
Median monthly mortgage cost	$2,597
Median monthly rent (1-bedroom)	$2,628
Mean Annual Household Earnings by Source	
Labor earnings	87.0%
Social security	25.2%
Retirement income	17.7%
Supplemental security income	0.0%
Cash public assistance income	1.7%
Food stamp/SNAP	0.8%

Source: U.S. Census Bureau American Community Survey 2022 5-Year Estimates, 2022: ECNSVY Business Patterns County Business Patterns, Teton County Housing Department

2.5 Capability Summary

As part of this regional plan development, a mitigation capability assessment was conducted by Teton County and the Town of Jackson. Existing plans, policies, and procedures that contribute to reducing hazard losses were evaluated. Combining the risk assessment with the mitigation capability assessment provided a clearer understanding of the region's overall vulnerability to disasters, allowing the goals, objectives, and actions of the plan to be more accurately focused.

To conduct this assessment, a matrix was created to inventory common mitigation activities. Policies and programs that were either in place or could be implemented, if appropriate, were identified. A comprehensive review of current policies, regulations, plans, projects, and programs was then undertaken to determine their contributions to reducing hazard-related losses.

2.5.1 Regulatory Mitigation Capabilities

Table 2-6 provides an assessment of Teton County's regulatory mitigation capabilities, based on input collected from the HMPC via data collection guides and information contained on county and municipal websites.

Table 2-6 Teton County Regulatory Capability Assessment

Capability Type	Teton County	Town of Jackson	Flat Creek Watershed Improvement District	Jackson Hole Airport Board	Teton Conservation District
Plans					
Capital Improvements Plan	Yes	Yes	No	Yes	N/A
Climate Change Adaptation Plan	No	No	No	N/A	N/A
Community Wildfire Protection Plan	Yes	Yes	N/A	N/A	Yes
Comprehensive/Master Plan	Yes	Yes	No	Yes	N/A
Continuity of Operations Plan	No	No	No	Yes	N/A
Economic Development Plan	No	No	N/A	N/A	N/A
Land Use Plan	Yes	Yes	N/A	N/A	Yes
Local Emergency Operations Plan	Yes	Yes	Yes	N/A	No
Stormwater Management Plan	In process	In process	No	Yes	Yes
Transportation Plan	Yes	Yes	N/A	N/A	N/A
All Hazards Recovery Plan	Yes	Yes	No	Yes	N/A
Substantial Damage Plan	No	No	No	N/A	N/A
Land Use Planning and Ordinances					
Acquisition of land for open space and public recreation use	Yes	Yes	Yes	N/A	N/A
Building code	Yes	Yes	N/A	N/A	N/A
Flood insurance rate maps	Yes	Yes	N/A	N/A	N/A
Floodplain ordinance	Yes	Yes	N/A	N/A	N/A
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Yes	N/A	N/A	N/A
Subdivision ordinance	Yes	Yes	Yes	N/A	N/A
Zoning ordinance	Yes	Yes	Yes	N/A	N/A

Source: Data provided by jurisdictions

- The Town and County **Capital Improvements Plans** are updated annually and can be utilized to implement mitigation projects. The Jackson Hole Airport Board Capital Improvements Plan is also updated annually as part of the budget process.

- The Town and County lack a formal **Climate Change Adaptation Plan**, but the Town incorporated adaptation into its 2024 **Sustainability Plan**. The Jackson Hole Airport Board is working on a **NetZero Plan** with the Federal Aviation Administration (FAA).
- The **Teton Conservation District's (TCD's) Flat Creek Watershed Management** Plan outlines strategies for managing water quality and habitat within the Flat Creek Watershed. Incorporating it into the assessment highlights efforts to mitigate flooding, improve water management, and persevere natural resources through land use policies and environmental regulations.
- The **Teton County Water Quality Master Plan** is a comprehensive plan guiding water quality protection through regulatory measures, including stormwater management, pollution control, and development standards. Including it in the assessment empathizes the county's commitment to sustainable water resource management and environmental health.
- The **Hazards Materials Emergency Response Plan** details emergency response procedures for hazardous materials incidents, including containment, evacuation protocols, and interagency coordination. Including it emphasizes Teton County's preparedness and capacity to manage chemical hazards, reducing public health and environmental risks.
- The **Community Wildfire Protection Plan** (CWPP) for the Town/County is due for an update in 2024/2025 and will include mitigation actions. The Teton Conservation District's CWPP, first created in 2005 and updated in 2014, will be revised by summer 2024. The Jackson Hole Airport Board has an **Airport Emergency Plan** for wildfire incidents on or in close proximity to the airport. The Airport Emergency Plan also addresses continuity of operations and emergency operations procedures.
- **Continuity of Operations Plans** are developed by individual departments; there is no overarching plan for the Town or County.
- The Flat Creek Watershed Improvement District's Emergency Operations Plan (EOP) addresses flooding hazards and was last updated in November 2021, with a new update underway.
- The **Land Use Plan** and **Land Development Regulations** (LDRs) for Jackson and the County govern zoning, development, and natural resource protection. The Airport Board's 2014 **Focus Master Plan** and **Airport Layout Plans** includes land use planning. Teton Conservation District's **Strategic** and **Long-Range Plan** outlines resource allocation and a vision for hazard mitigation.
- The Teton Conservation District leads efforts on the **Teton County Water Quality Management Plan**, mapping water resource sensitivity and vulnerability. The Town's LDRs include stormwater management provisions. The Airport Board incorporates stormwater management into its **Spill Prevention, Control, and Countermeasures Plan**.
- The Town and County **Transportation Plan**, last updated in September 2015, outlines transportation-related strategies. The Airport Board includes emergency transportation in its **Airport Emergency Plan**.
- The joint Town/County **All-Hazards Recovery Plan**, updated in 2022, emphasizes the integration of mitigation into recovery.

The Town of Jackson has comprehensive zoning and subdivision regulations covering land use, density, design, parking, landscaping, and development on steep slopes. Development is generally prohibited on slopes over 25%, and a Conditional Use Permit is required for slopes over 10%. Geotechnical reports are required for development on steep or historically unstable slopes, though updates to hazardous slope regulations have been passed by the Council.

The Fire Department enforces portions of the Wildland-Urban Interface (WUI) code for development in WUI areas, and the Engineering Department oversees floodplain and steep slope regulations. The Building Department enforces the adopted building codes, with plans to update to the 2024 versions, while the Fire and Engineering Departments handle specific responsibilities.

The list of building codes adopted by the Town is outlined below, with plans to adopt the updated 2024 versions of the same codes. The Building Department enforces these codes, with the exception of specific responsibilities handled by the Fire Department and Engineering Department. The Jackson Hole Airport Board follows Town/County building codes.

Current Adopted Codes

- 2021 International Energy Conservation Code
- National Electrical
- Fire/EMS- Electrical Division.
- 2024 International Building Code
- International Fire Code and International Wild land- Urban Interface
- 2024 International Fuel Gas Code
- 2024 International Mechanical Code
- 2024 International Plumbing Code
- 2024 International Residential Code

International Residential Code – Climatic and Geographic Design Criteria

- Flood Hazards - 1989
- Frost Line Depth - 34 inches
- Ground snow load - 93 pounds per square feet
- Ice Shield Underlayment Required - Yes
- Mean Annual Temp - 38 degrees
- Seismic Design Category - D
- Termite - None to Slight
- Weathering - Severe
- Wind Speed - 115 mph
- Winter Design Temperature - 30 degrees

NFIP Participation and Continued Compliance

Teton County and the Town of Jackson have adopted the minimum floodplain management criteria set by the National Flood Insurance Program (NFIP) through local regulations, along with the most recent effective Flood Insurance Rate Map (FIRM). In addition, both the County and Town implement and enforce local floodplain management regulations, which govern development within Special Flood Hazard Areas (SFHAs). This enforcement includes a permitting process to ensure compliance with established standards. Table 2-7 includes information on each jurisdiction's compliance with the NFIP.

Table 2-7 NFIP Status in Teton County

Jurisdiction	Date Joined	Effective Map Date	Floodplain Administrator
Teton County	05/04/89	09/16/15	County Engineer
Town of Jackson	05/04/89	09/16/15	Town Engineer

Source: NFIP Community Status Book, Town and County Floodplain Regulations

All substantial improvements and substantial damage reconstructions following an event must comply with current regulations set forth by the County and Town. In special flood hazard areas, new construction and substantial improvements must be anchored to prevent flotation or movement from flood forces, utilize flood-resistant materials, and be designed to minimize flood damage. Critical systems, including electrical, plumbing, and HVAC, must be designed to prevent water infiltration. Additionally, water supply and sewage systems must be protected from floodwater, and on-site waste disposal systems must be designed to avoid impairment or contamination during flooding. These standards ensure compliance with NFIP requirements.

2.5.2 Administrative/Technical Resources

Table 2-8 identifies the administrative and technical resources available to the County and Town.

Table 2-8 Administrative and Technical Resources

CAPABILITY TYPE	TETON COUNTY	TOWN OF JACKSON	FLAT CREEK WATERSHED IMPROVEMENT DISTRICT	JACKSON HOLE AIRPORT BOARD	TETON CONSERVATION DISTRICT
Administrative					
Building Official	Yes	Yes	Yes	Yes	N/A
Civil Engineer	Yes	Yes	Yes	Yes	N/A
Community Planner	Yes	Yes	Yes	N/A	N/A
Emergency Manager	Yes	Yes	Yes	Yes	N/A
Floodplain Administrator	Yes	Yes	Yes	N/A	N/A
GIS Coordinator	Yes	No	Yes	Yes	Yes
Planning Commission	Yes	Yes	Yes	N/A	N/A
Technical					
Grant writing	Yes	Yes	Yes	Yes	Yes
Hazard data and information	Yes	Yes	Yes	Yes	Yes
GIS analysis	Yes	No	Yes	N/A	Yes
Mutual aid agreements	Yes	Yes	Yes	Yes	No

Source: Data provided by jurisdictions

- Both the County **Building Official** and **Civil Engineer** for the Town and County states that staffing is sufficient to enforce regulations, though formal training in hazards and mitigation is lacking. Coordination between agencies is good with room for improvement.
- The Jackson Hole Airport Board Facilities Director acts as their **Building Official** and **Emergency Manager**. The Facilities Director feels there is good coordination between agency and staff. The Director believes staff are well-trained on hazards and mitigation, with sufficient personnel to enforce regulations.

- The Jackson Hole Airport Board contracts a **civil engineer** and **GIS coordinator.**
- The Town and County's **Emergency Management**, staffed by two people, faces challenges in keeping up with plan updates, grant administration, and maintaining response readiness. They have started creating an internal hazard database, with plans to expand this capability with a new County **GIS Coordinator** that started in March 2024.
- Teton Conservation District regularly uses **GIS** datasets to inform mitigation activities for vegetation, water, air, and soil.
- The County utilizes the towns **grant writing** staff, and the Town of Jackson has contracted grant writer services that can support the County. The county utilizes the new Wyoming Grants Management Office and the Technical Assistance Center at Montana State University. Teton Conservation District is finalizing a grant for winter ice flooding and supports grant writing for Western States Wildland Urban Interface grants, as well as providing grants and technical assistance for wildfire, flooding, and erosion control mitigation. The Jackson Hole Airport Board has the staff for day-to-day operations, but grants could provide additional support, though pursuing them diverts time and resources.
- The County participates in the **Wyoming Inter-County Mutual Aid Agreement** (WICMAA) and established an interstate **mutual aid agreement** with Teton County, Idaho, in 2023. They also have sheltering agreements with the American Red Cross, PAWS of Jackson Hole, and Teton County Voluntary Organizations Active in Disasters. The Town falls under each of these agreements, except for WICMAA.

Teton County Emergency Management

Teton County Emergency Management is a division of Teton County government. Its mission is to empower the whole community, including the county's visitors, to become more disaster-resilient through the coordination of disaster prevention, protection, response, recovery, and mitigation between a multitude of partners, both public and private. They are the clearinghouse for the Teton County/Town of Jackson whole community emergency planning efforts, which consists of several governmental emergency and mitigation plans, including this updated HMP. As such, Teton County Emergency Management is the local source for emergency planning and support, including these additional services:

- Training & Exercises
- Grant Assistance & Administration
- Emergency Operations Center Management
- Alert, Warning, and Notification (AWNs) System Coordination

In 2015, both Teton County and the Town of Jackson adopted resolutions to designate Teton County Emergency Management as the local homeland security program for both the county and the town to meet Wyoming state statutes, with the appointed Teton County Emergency Management Coordinator serving as the lead for Emergency Management efforts in both jurisdictions. Rich Ochs currently serves as the Teton County Emergency Management Coordinator, and as the local lead for this plan update.

Local Emergency Planning Committee and Planning Meetings

The Teton County Local Emergency (LEPC) has membership from a broad cross-section of the community including health care, public works, emergency services, elected officials, media, all levels of government, and the schools. The National Park Service (Grand Teton National Park) and Bridger-Teton National Forest have representatives on the LEPC and attended LEPC meetings where the update was discussed. The times, dates, and agendas of the LEPC meetings are posted on the County's website and legal ads with all the LEPC meetings for the year are posted semiannually.

2.5.3 Financial capabilities

Table 2-9 identifies the County and Town financial tools or resources that the jurisdictions have access to or are eligible to use and could potentially be used to help fund mitigation activities.

Table 2-9 Financial Capabilities

CAPABILITY TYPE	TETON COUNTY	TOWN OF JACKSON	FLAT CREEK WATERSHED IMPROVEMENT DISTRICT	JACKSON HOLE AIRPORT BOARD	TETON CONSERVATION DISTRICT
Capital improvements project funding	Yes	Yes	Yes	Yes	N/A
Community Development Block Grant	Yes	Yes	No	N/A	N/A
Federal funding programs (non- FEMA)	Yes	Yes	No	Yes	Yes
Fees for water, sewer, gas, or electric services	No	Yes	No	N/A	N/A
Impact fees for new development	Yes	Yes	No	Yes	N/A
State funding programs	No	Yes	No	Yes	Yes
Stormwater utility fee	No	No	No	N/A	N/A
FEMA funding	Yes	Yes	Yes	Yes	Yes

Source: Data provided by jurisdictions

- County and Town **Capital Improvements Project** funding has supported both past and future mitigation actions. The Jackson Hole Airport Board has used these funds for drainage improvements, as well as stormwater detention and filtration systems.
- **Community Development Block Grants** have been used in the past and could be utilized in the future for both Jackson and the County, but their use depends on approval from the State Land and Investments Board.
- Federal **non-FEMA funding**, particularly through USDA and land management agency grants, has supported wildfire mitigation efforts in the Town and County. The Jackson Hole Airport Board has received Airport Improvement Program and Bipartisan Infrastructure Law funding. Teton Conservation District commonly couples Natural Resources

Conservation Service (NRCS) funding with private land projects for erosion control, such as NRCS Emergency Watershed Program funds used for post-fire erosion management.

- While the Town of Jackson does have **fees for water and sewer** services, they are not specifically used for mitigation. The Lower Valley Energy Cooperative supplies gas and electric.
- County and Town **impact fees** for new development are directed toward housing mitigation, though it is unclear if any portion goes toward hazard mitigation. Impact fees from the Jackson Hole Airport Board We go towards improvements.
- Energy Mitigation Funds are collected as fees by the Planning & Buildings department for large-scale building construction projects to offset their environmental impact. These funds are later used to upgrade government facilities, making them more energy-efficient and reducing their overall carbon footprint.
- **FEMA funding** has primarily been used for writing mitigation plans. The County and Town have not successfully applied for FEMA mitigation grants, though some districts, like the Flat Creek Watershed Improvement District, have. FEMA funding for the Jackson Hole Airport Board is currently only used for disaster relief.
- The **Specific Purpose Excise Tax (SPET)** is a voter-approved sales tax of one cent per dollar spent by residents and visitors. Its purpose is to fund specific community projects without increase the overall tax rate. SPET will potentially have mitigation elements as part of construction.
- The Teton Conservation District regularly leverages **state funds** for hazard mitigation, including the Wyoming Water Development Office's Small Water Project Program, and plans to continue this practice. The town actively utilizes both state and federal funding sources, drawing on these resources for current projects as well as past initiatives.
- The Flat Creek Watershed Improvement District has the latitude (through state statute-defined parameters) to impose member assessments that can be put toward funding mitigation activities. This has taken place in the past and is a mechanism the district is currently using.
- A recommendation to establish a stormwater utility fund will be included in the Town's **Stormwater Management Program**. While such fun is not currently in place, a creation seems inevitable to support sustainable stormwater management and infrastructure improvements.

2.5.4 Education and Outreach Capabilities

Table 2-10 shows the education and outreach mitigation capabilities the County and jurisdictions have in place.

Table 2-10 Education and Outreach Capabilities

CAPABILITY TYPE	TETON COUNTY	TOWN OF JACKSON	FLAT CREEK WATERSHED IMPROVEMENT DISTRICT	JACKSON HOLE AIRPORT BOARD	TETON CONSERVATION DISTRICT
Community newsletters	Yes	Yes	No	Yes	Yes
Hazard awareness campaigns	Yes	Yes	No	Yes	Yes
Local news	Yes	Yes	No	Yes	Yes
Organizations that represent/advocate	Yes	Yes	No	N/A	N/A

CAPABILITY TYPE	TETON COUNTY	TOWN OF JACKSON	FLAT CREEK WATERSHED IMPROVEMENT DISTRICT	JACKSON HOLE AIRPORT BOARD	TETON CONSERVATION DISTRICT
for/interact with underserved and vulnerable communities					
Social media	Yes	Yes	No	Yes	Yes
Public Alert, Warning, and Notification systems	Yes	Yes	No	No	No
Other	No	No	Yes	No	No

Source: Data provided by jurisdictions

- The Town and County produce **electronic newsletters**, with the County's featuring an emergency management topic monthly. Teton Conservation District sends bi-weekly water updates, including flood and drought information, to approximately 150 email addresses, and a quarterly newsletter on natural resources to about 500 recipients, including hazard mitigation information when relevant.
- The Jackson Hole Airport Board has two staff members managing public relations across various platforms.
- Teton County is recognized as **StormReady** and serves as a **WeatherReady** Nation ambassador with the National Weather Service.
- Town and County Emergency Management shares monthly preparedness topics through ads, radio spots, social media, and press releases, and **conducts outreach** at local events. The Jackson Hole Airport Board participates in various **public awareness events**. Teton Conservation District administers a Wildfire Risk Reduction Program that includes **education and outreach**. It also leads the Teton Area Wildfire Protection Coalition, which features an educational component.
- The area has one daily print **newspaper**, the Jackson Hole News and Guide, and a longer-form **weekly publication**. Several local **online news providers** and several **radio stations**—Jackson Hole Radio Network (KMTN, KZJH, KJAX, and KSGT), Jackson Hole Community Radio (KHOL), Wyoming Public Media (KUWJ), and K-LOVE (KMLT)—serve the community. Spectrum provides cable television to some areas of the County but does not have a public access channel or local programming. Teton Conservation District maintains close contacts with Buckrail and the JH News and Guide for hazard mitigation stories.
- The Teton County Voluntary Organizations Active in Disaster consists of **local nonprofits** and houses of worship focused on disaster assistance, particularly for underserved communities. The Teton County Systems of Care is another nonprofit consortium providing various human services.
- The Town and County manage their own **social media** accounts, with many departments operating separate platforms. Teton Conservation District uses social media to communicate about all its programs. The Flat Creek Watershed Improvement District shares information through its website.
- Teton County Emergency Management oversees the Teton_WY Alerts system, powered by Everbridge, which provides **emergency notifications** and lower-priority preparedness messages via phone, text, email, and TTY.

2.5.5 Opportunities for Enhancement

Based on the capabilities assessment Teton County, the districts, and the Town of Jackson have several existing mechanisms in place to mitigate hazards. However, there are opportunities to expand or improve policies, programs, and fiscal capabilities to further protect the community. One key area for improvement is enhancing GIS capabilities within both the Town and County. Being able to effectively map and share hazard data with the public will be a crucial educational tool. The public must understand the hazards present in the area and how they relate to where they live and work. While the plan itself may not be widely read by the general public, mapping and making the data easily accessible online will bring the mitigation plan to life and improve public awareness.

Additionally, future improvements may involve providing more training for staff members on hazard mitigation and grant funding in partnership with the County and Conservation District. These training opportunities will equip staff with the knowledge to better integrate hazard information and mitigation projects into their departments, resulting in more informed personnel who can effectively communicate risks to the public. Other opportunities for enhancement are outlined below.

Teton County

- Consider developing a Substantial Damage Plan to guide safe, sustainable rebuilding after disasters, including levee failures, for the 3,117 residents living behind the 24.5 miles of levees along the Snake and Gros Ventre Rivers, which protect $7.7 billion in property value.
- Consider drafting a Regional Evacuation Plan to prepare strategies for managing evacuations which exceed the day-to-day capabilities of various agencies and normal route capacity.
- Consider implementing a seismic retrofitting program for critical facilities to address the projected damage to 9,768 buildings—approximately 72.9% of the total building stock—during a significant earthquake, including the potential destruction of 365 buildings.
- Explore options for upgrading stormwater management regulations to improve drainage infrastructure, including culverts, ditches, and storm drains, aimed at managing runoff from spring snowmelt and heavy rainstorms in the unincorporated County.
- Explore implementing water conservation programs that educate the community about efficient water use policies, addressing the impacts of climate change on snowpack and water availability.

Town of Jackson

- Consider employing a GIS coordinator to analyze spatial data and create detailed hazard maps, identifying areas at high risk for natural hazards, which will inform effective hazard mitigation planning.
- Consider developing a retrofitting program to reinforce older structures, particularly in downtown and older residential areas, to enhance resilience against seismic activity, prioritizing critical infrastructure such as schools, hospitals, fire stations, and government buildings due to the Town's proximity to the proximity to the Teton fault.
- Consider developing and maintaining clear evacuation plans and routes, complete with proper signage and emergency notifications, to ensure residents can evacuate safely in case of wildfire, given the Town’s reliance on key transportation routes like Highway 89 and Highway 22.

Flat Creek Watershed Improvement District

- Explore options for upgrading stormwater management regulations, including permeable pavements and green infrastructure, to reduce the impact of winter flooding in the planning area.

Jackson Hole Airport Board

- Explore the possibility of employing or contracting a full-time grant writer to research and identify funding sources at local, state, and federal levels, as well as private foundations, to support specific projects related to hazard mitigation, climate resilience, and community development.

Teton Conservation District

- Explore ongoing investment in community workshops and programs focused on drought-resistant landscaping and fuel reduction strategies to educate residents on mitigating wildfire risks due to prolonged drought.
- Consider hiring or contracting a Spanish Translator to ensure that key messaging about local natural hazard issues s effectively communicated to Spanish-speaking residents. It is important to direct this messaging through outlets and channels that are specifically accessed by Spanish speakers in the community to increase awareness and address potential barriers.

3 Planning Process

Requirements §201.6(b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1) *An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*
2) *An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and*
3) *Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

3.1 Background on Mitigation Planning in Region 8

Teton County has a long history with hazard mitigation planning, beginning with the first plan developed in 2004, as well as the updates in 2010, 2016, and 2020 consistent with the five-year update requirement..

Regional Planning. In Wyoming, the Wyoming Office of Homeland Security (WOHS) utilizes a regional support structure to assist the counties with all aspects of emergency management, including planning. In 2016, the WOHS began the process of initiating the development of regional hazard mitigation plans statewide. While most of the regions comprise two to three counties, Region 8 includes only Teton County. This initiative recognized that the process of facilitating and developing or updating multi-jurisdictional hazard mitigation plans compliant with the Disaster Mitigation Act of 2000 is often beyond local capabilities and expertise. Instead of each county hiring consultants, the WOHS took the lead in procuring and funding a professional hazard mitigation planning consultant through a competitive bid process. WSP USA Environment and Infrastructure Inc. (WSP) was selected in 2019 to provide assistance to the State and planning regions under a five-year contract; the Region 8 planning effort began in early 2024.

3.2 Government Participation

Prior to initiating the development of this regional hazard mitigation plan's update in 2024, a substantial coordination effort took place to ensure the participation of all appropriate entities within Region 8. Teton County has an Emergency Management Coordinator (EMC), who was designated as the primary point of contact and lead coordinator for the plan update. The county EMC then contacted each of the former participating jurisdictions, as well as potentially eligible special districts, offering them the opportunity to participate in the 2024 update of the Region 8 Hazard Mitigation Plan.

Teton County and the Town of Jackson participated in and adopted the original HMP in 2004, as well as the prior three updates. Consistent with the 2020 update, this plan includes the Teton Conservation District as a participating entity. Additionally, following outreach to multiple special distircts, the 2024 update added the Jackson Hole Airport Board (Airport) and Flat Creek Watershed Improvement District as participating entities. The DMA planning

regulations and associated FEMA guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the Hazard Mitigation Planning Committee (HMPC);
- Detail areas within the planning area where the risk differs from that facing the entire area;
- Identify specific projects to be eligible for funding; and
- Have the governing board formally adopt the plan.

For the Region 8 Multi-Hazard Mitigation Plan's HMPC, "participation" meant:

- Attending and participating in HMPC meetings and workshops;
- Establishing or reconvening a local steering committee;
- Providing available data requested by the HMPC coordinator and WSP;
- Providing and updating the hazard profile and vulnerability details specific to jurisdictions;
- Developing, updating and providing input on the local mitigation strategy (action items and progress);
- Advertising and assisting with the public input process;
- Reviewing and commenting on plan drafts; and
- Coordinating the formal adoption of the plan by the governing boards.

Documentation of participation is included in Appendix A in the form of meeting sign in sheets, meeting summaries, and more.

Teton County Emergency Management worked in concert with the WOHS hazard mitigation planning consultant - WSP. As the planning consultant, WSP's role was to:

- Provide guidance on a planning organization for the entire planning area representative of the participants;
- Ensure the plan meets all the DMA requirements as established by federal regulations, following FEMA's most recent planning guidance;
- Facilitate the entire planning process;
- Identify the data requirements that the participating jurisdictions could provide, and conduct the research and documentation necessary to augment that data;
- Develop and help facilitate the public input process;
- Produce the draft and final plan documents; and
- Ensure acceptance and approval of the final Plan by WOHS and FEMA Region VIII

3.3 The 10-Step Planning Process

WSP established the planning process for the Region 8 plan using the DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-step process:

1. Organize the Planning Process Resources
2. Assess Risks
3. Develop a Mitigation Strategy
4. Adopt and Implement the Plan

Into this four-phase process, WSP integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance (FMA) programs. Thus, the modified 10-step process used for this plan meets the requirements of FEMA's Hazard Mitigation Assistance (HMA) grant programs, the CRS program, and flood control projects authorized by the U.S. Army Corps of Engineers. FEMA's Local Mitigation Planning Handbook (updated in May 2023) recommends a nine-task process within the four-phase

process. Table 3-1 summarizes the four-step DMA process, the detailed CRS planning steps and work plan used to develop the plan, the nine handbook planning tasks from FEMA's 2013 Local Mitigation Planning Handbook, and where the results are captured in the Plan. The sections that follow describe each planning step in more detail.

Table 3-1 Mitigation Planning Process Used to Develop the Regional Hazard Mitigation Plan

FEMA 4 STEP GUIDANCE	COMMUNITY RATING SYSTEM (CRS) PLANNING STEPS (ACTIVITY 510) AND WSP WORK PLAN STEPS	FEMA LOCAL MITIGATION PLANNING HANDBOOK TASKS (44 CFR PART 201)	LOCATION IN PLAN
Step 1: Organize the Planning Process Resources	Step 1. Organize Resources	1: Determine the Planning Area and Resources	Chapters 1, 2 and 3
		2: Build the Planning Team 44 CFR 201.6(c)(1)	Chapter 3, Section 3.3.1
	Step 2. Involve the Public	3: Create an Outreach Strategy 44 CFR 201.6(b)(1)	Chapter 3, Section 3.3.1
	Step 3. Coordinate with Other Agencies	4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3)	Chapter 3, Section 3.3.1
Step 2: Assess Risks	Step 4. Assess the Hazard	5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(i) 44 CFR 201.6(c)(2)(ii) & (iii)	Chapter 4
	Step 5. Assess the Problem		Chapter 4
Step 3: Develop a Mitigation Strategy	Step 6. Set Goals	6: Develop a Mitigation Strategy 44 CFR 201.6(c)(3)(i); 44 CFR 201.6(c)(3)(ii); and 44 CFR 201.6(c)(3)(iii)	Chapter 5, Section 5.2
	Step 7. Review Possible Activities		Chapter 5, Section 5.3
	Step 8. Draft an Action Plan		Chapter 5, Section 5.4
Step 4: Adopt and Implement the Plan	Step 9. Adopt the Plan	7: Review and Adopt the Plan	Chapter 6
	Step 10. Implement, Evaluate, Revise	8: Keep the Plan Current	Chapter 6
		9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4)	Chapter 6

3.3.1 Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With the jurisdiction's commitment to develop a Regional Plan, WSP worked with WOHS and the County EMC to establish the framework and organization for the process. Organizational efforts were initiated to inform and educate the plan participants of the purpose of and need for a regional hazard mitigation plan. During the update of this Regional Plan, the planning process was directed through a regional planning committee composed of Teton County Emergency Mangagement (TCEM), as well as participating jurisdictions. For this update, the Teton County Local Emergency Planning Committee (LEPC) served as the Planning Team or Hazard Mitigation Planning Committee (HMPC). In addition to planning for chemical emergencies, Teton County's LEPC is a whole-community group that helps with the development and review of Teton County's canon of emergency plans including the Emergency Operations Plan, All-Hazards Recovery Plan, Integrated Preparedness Plan, Hazard Mitigation Plan, Hazardous Materials Emergency Response Plan, and Threat and Hazard Identification Risk Assessment. The LEPC has membership from a broad cross-section of the community including health care, public works, emergency services, elected officials, media, all levels of government, and the schools.

The planning consultant held an initial coordination call in November 2023 to discuss the organizational aspects of the planning process with TCEM. Participants on this call included the county EMC, WSP and the Wyoming Office of Homeland Security. Using FEMA's planning guidance, representative participants for the Region's HMPC base membership was established, with additional invitations extended as appropriate to other federal, state, and local stakeholders and the public throughout the planning process. The county EMC, with assistance from WSP, identified key county, municipal and other local government and stakeholder representatives. Letters of invitation were emailed to invite them to participate as members of the HMPC, and to attend a series of planning meetings. The list of agencies and individuals invited to participate on the HMPC is provided in Table 3-2. Those listed in the table attended at least one of the meetings. More details with documentation of participation and full meeting minutes included are in Appendix A.

Table 3-2 HMPC Members and Stakeholders by County

TETON COUNTY			
JURISDICTIONS AND STAKEHOLDERS	**TITLE**	**REPRESENTATIVES**	**ATTENDED PLANNING MEETINGS**
Teton County	Facilities Maintenance Manager	Josiah Nash	**X**
	Search and Rescue Coordinator	Mike Estes	**X**
	Public Information Officer	Kristen Waters	**X**
	Emergency Management Coordinator	Rich Ochs	**X**
	Chief Deputy Coroner	Russell Nelson	**X**
	Radio Coordinator	Quentin Johnston	**X**
	Emergency Management Program Specialist	Anna Day	**X**
	Community Health Manager / PIO	Rachel Wheeler	**X**
	GIS Administrator	Jansen Lyons	**X**
	Public Health Response Coordinator	McKinnley Cox	**X**
	Director of Planning and Building	Chris Neubecker	**X**
	Sheriff's Office- Dispatch Manager	Riclyn Betsinger	**X**
	Administrator	Jodie Pond	
	Sustainability Coordinator	Erik Kimball	**X**
Town of Jackson	Town Manager	Tyler Sinclair	**X**
	Town Engineer	Brian Lenz	**X**
	Public Works Director	Floren Poliseo	**X**
	Ecosystems Stewardship Administrator	Tanya Anderson	**X**
	Assistant Public Works Director	Johnny Ziem	**X**
	Jackson Police Department Lieutenant	Russ Ruschill	**X**
	Community Engagement Specialist	Susan Scarlata	**X**
Teton Conservation District	Land Resource Specialist	Robb Sgroi	**X**
	Water Resources Specialist	David Lee	**X**
	Executive Director	Carlin Girard	**X**
Flat Creek Watershed Improvement District	Chairman of the Board	Sandy Buckstaff	**X**
Jackson Hole Airport	Chief Operations Officer	Dustin Havel	**X**
	Operations Director	Alton George	**X**

TETON COUNTY			
Jackson Hole Fire/EMS	Interim Assistant Chief	Brian Coe	**X**
	Wildland Fire Prevention Specialist	Bobbi Clauson	**X**
	Interim Chief	Mike Moyer	**X**
	Administrative Assistant	Shannon Burns	**X**
Housing, Health, and Vulnerable populations and Non-Profits Stakeholders	Good Samaritan Mission - CEO	Wayne Richardson	**X**
	Teton County Voluntary Organizations Active in Disasters (VOAD) – Chairman	Rev. David Bott	**X**
	One22 Community Resource Center	Carey Stanley	**X**
	American Red Cross of Wyoming	Mary Lou Klene	**X**
	American Red Cross of Wyoming	Dee Buckstaff	
	Presbyterian Church of Jackson Hole	Michael Schrotz	**X**
	Jackson Hole Lions Club	Michael Schrotz	**X**
	Whole Food Rescue	Shel Hills	**X**
	Teton County VOAD – Secretary	Karen Walker	**X**
	PAWS Animal Welfare Group	Sam Diaz	**X**
Other Stakeholders (Neighboring jurisdictions, State and Federal Agencies, Lifeline providers)	Fremont County- Assistant EM Coordinator	Andrea Ladd	**X**
	Fremont County- EM Coordinator	Milan Vinich	**X**
	Jackson Hole Radio-Manager	Scott Anderson	**X**
	National Park Service- Emergency Services Coordinator	Levi Yardley	**X**
	Wyoming Office of Homeland Security- Grants/Finance Section Chief	Ashley Paulsrud	**X**
	Teton Outpatient Services- Administrator	Phil Ramsey	**X**
	Teton Village Water & Sewer	Alan Svalberg	**X**
	Integrated Solid Waste and Recycling	Becky Kieffer	
	Teton County School District – Executive Director of Communications and District Services	Charlotte Reynolds	**X**

During the plan development process, communication amongst the LEPC occurred through a combination of face-to-face meetings, monthly conference calls, web-based meetings, phone calls, and email correspondence. Targeted input for each participating jurisdiction was collected with a Plan Update Guide (PUG) and Mitigation Action Tracker that was developed by WSP but distributed through the county EMC.

Following the initial kickoff webinar on January 18, 2024, two primary planning workshops with the HMPC were held during the plan's development during March and June 2024. The full schedule of Planning Team Meetings is provided in Table 3-3below. The bi-monthly (held on odd-numbered months) LEPC meetings were used as additional check-ins on the planning effort and in several cases attended by the WSP planning consultants to provide an update on progress or coordination on planning items. In addition, monthly conference calls were held with the EMC and WSP to discuss the process including upcoming milestones and information needs. The sign-in sheets and agendas for each of the meetings are included in Appendix A.

Table 3-3 Schedule of HMPC Meetings

MEETING AND TOPIC	DATE	MEETING TYPE	LOCATION
Initial Coordination Call	11/20/23	Virtual	
HMP Update Kickoff and LEPC Meeting	1/18/24	Hybrid	Teton County EOC
HIRA Overview LEPC Meeting	3/21/24	Hybrid	Teton County EOC
Mitigation Goals Update and Action Status/LEPC Meeting	5/16/24	Hybrid	Teton County EOC
Mitigation Strategy Workshop Meeting	6/11/24	Hybrid	Teton County Library
July LEPC Meeting – check in meeting	7/18/24	Hybrid	Teton County EOC
September LEPC Meeting – check in on draft plan	9/19/24	Hybrid	Teton County EOC

During the kickoff meeting, WSP presented information on the scope and purpose of the plan update, participation requirements of HMPC members, and the proposed project work plan and schedule. Plans for public involvement (Step 2) and coordination with other agencies and departments (Step 3) were discussed. The HMPC reviewed the hazard identification information for the Region and refined the list of identified hazards to mirror that of the Wyoming Hazard Mitigation Plan.

In follow-up to the meeting, WSP provided a Geographic Information Systems (GIS) data needs worksheet, a Plan Update Guide to facilitate the collection of information needed to support the plan update, and a summary of the conference call/webinar. The WSP Plan Update Guide helped to facilitate the collection of information needed to support the plan update, such as data on historic hazard events, values at risk, and current capabilities. Participating jursidications completed and returned the worksheets in the Plan Collection Guide to Teton County's EMC and WSP. WSP integrated this information into the plan, supporting the update of Chapters 2 and 4.

In some cases, HMPC meetings were supplemented with additional meetings, emails, and telephone discussions to further engage stakeholders in the process. During the planning process the EMC regularly engaged participating jurisdictions and County departments for additional discussions on the planning effort in addition to stakeholders described in Planning Step 3 below.

Planning Step 2: Involve the Public

The 2024 planning process informed and involved the public early in the process. In some cases, the LEPC meetings included members of the public, such as Community Emergency Response Team members. Public outreach included press releases, social media notices, and a survey. Social media was commonly used to share information related to hazards, and to inform the public on ways to share input on the plan update process. A project backgrounder was developed to share with the public and interested stakeholders.

2024 Public Survey

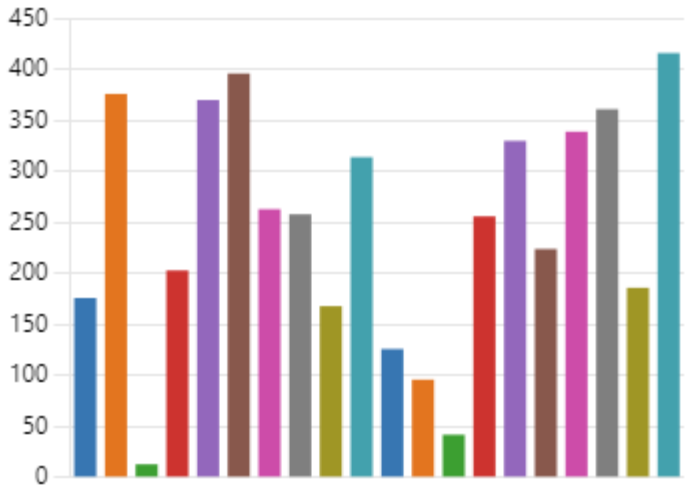
During the regional planning process and drafting stage, a public survey was developed as a tool to gather public input to inform the update process. The survey was for the public to provide feedback on topics related to hazard concerns and reducing hazard impacts. The survey provided an opportunity for public input during the planning process prior to finalization of the plan update. The survey gathered public feedback on concerns about wildfires, floods, winter storms and other hazards, and solicited input on strategies to reduce their impacts. The survey was released as an online tool in early March and closed on April 12, 2024. The county EMC emailed the link to the public survey to the LEPC, asking them to share it with the public, or post it to their social media page. The survey was also distributed through a Town of Jackson employee email group and an all employee group for Teton County. Additionally, a Teton_WY Alerts powered by Everbridge notification was sent to over 15,000 subscribers on March 8, 2024 informing them of the plan update and requesting they fill out an online survey to provide plan feedback. In addition the survey was emailed to the County Voluntary Organizations Active in Disasters (VOAD) group.

A total of 622 public responses were received across the entire region. The results of the survey are summarized here, captured in Appendix A, and were shared with the LEPC to inform the planning process. The highest rated hazards in Region 8 were wildfire, severe winter weather, and avalanche.

Figure 3-1 displays the results from Question 4, which reads: *The following types of mitigation actions may be considered in this plan. Please indicate all the types of mitigation actions that you think should have the highest priority in Wyoming Region 8 Hazard Mitgation Plan. These results will be considered during the planning process*. The results indicated wildfire defensible space promotion and assistance as the most important mitigation action category. Other high rated actions included generators for critical facilities, wildfire fuels treatment projects, and critical faciltities protection. Excerpts of responses to two open ended questions were provided to the CPTs during the mitigation strategy workshops: “Do you have information on specific hazard issues/problem areas that you would like the planning committee to consider? “ and “Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters”. Additional results of the survey are included in Appendix A, Planning Process Documentation.

Figure 3-1 Public Survey Results – Mitigation Action Category Preferences

Expanded indoor/outdoor warning	176
Wildfire/Grass fire fuels treatment projects	376
Tornado safe rooms	13
Continued participation in the National Flood Insurance Program	203
Critical facilities protection (water, public safety, shelters)	370
Generators for critical facilities	396
Planning/Zoning to avoid impacts to future development	263
Public Education/Awareness on hazards	258
Stormwater drainage improvements	168
Forest health/watershed protection	314
Flood mitigation for residential properties	126
Education and discounts on Flood Insurance	96
Flood prone property buyout	42
Water conservation	256
Evacuation route development	330
Dam safety	224
Transportation lifeline resiliency (including rockfall/landslide or avalanche mitigation)	339
Utility lifeline resiliency (including strengthening power line infrastructure from wind impacts)	361
Landslide hazard mitigation	186
Wildfire defensible space promotion and assistance	416



Question 6 of the Public Survey said *please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters.* Some common themes among responses are noted below:

- "Because we have so many newcomers to the valley, education on risks and mitigation is vital."
- "Encourage new development to be resilient (designed for future conditions, efficient, built away from flood zones and WUI, landscaped for resilience)".
- "Cannot emphasize the wildfire hazard reduction enough here- needs to be much more particular in more rural areas of the county and in Wilson".
- "Expanding all roadways in and out of Jackson to four lanes, including 22, Teton Pass, & the Village Road. Our current infrastructure cannot safely or efficiently accommodate the population."
- "Plan for if the Snake River Bridge is compromised; tunnel under Teton Pass; traffic safety; lack of egress".
- "Planning for evacuation transportation for residents who will not be able to leave if this is not provided. Some accommodation for pets should be included or people will not go."
- "The lives you save through this planning process may be all of ours. Thank you."

The above comments were shared with the LEPC during the mitigation strategy update process for consideration.

Prior to finalizing the update, a draft of the regional plan was made available to the public for review and comment. The plan was placed on the Wyoming OHS's web page, and the counties used social media, a press release and email blasts to announce the public comment period. An online feedback form was provided to collect specific comments. Four persons viewed the comment form and left comments, which were shared with the HMPC prior to completion of the final plan. Multiple of these comments concerned the county's plans and abilities concerning evacuations, particularly with wildfire, wishing to ensure there is adequate planning and redundancy in the event of a widespread evacauation. This concern is supported by multiple mitigation actions identified in Chapter 5. These comments were shared with the HMPC and resulted in minimal changes in the final plan, as these comments are largely addressed by other planning efforts being undertaken by the County. The full comments can be viewed in Appendix A for consideration in future plan updates.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the HMPC determined that data collection, mitigation strategy development, and plan approval would be greatly enhanced by inviting state and federal agencies and organizations to participate in the process. Neighboring communities and regional agencies involved in hazard mitigation activities (such as the Conservation District and federal land management agencies), agencies that have the authority to regulate development (local governments), as well as other interests, businesses, academia and other private and non-profit interests, were also invited to provide feedback. Other interests included community lifeline/infrastructure such as rural electric cooperatives and industry representatives. Based on their involvement in hazard mitigation activities or their role in land stewardship in the Region, representatives from several state and federal agencies and local businesses were included in the HMPC in 2024 and are noted in Table 3-2. The National Park Service and the Bridger-Teton National Forest had representatives on the LEPC and attended LEPC meetings where the update was discussed.

Nonprofits and community-organizations that represent socially vulnerable populations, public health, and housing were specifically invited to particpate in the plan update process. Some organizations, such as the Red Cross, the Teton County School District and St John's

Medical Center were already members of the LEPC. Outreach on the planning effort in an effort to reach socially vulnerable populations was also done through the Teton Volunteer Organizations Active in Disasters (VOAD), which met on a quarterly basis and provided a forum for discussing related concerns.

Many of these stakeholders participated in planning meetings or were provided an opportunity to review the draft plan before it was finalized. Some of the State and Federal agencies which were invited to participate in the process attended meetings, provided data and information for the plan update, or provided feedback.

Stakeholder Engagement and Feedback

As noted, standing quarterly meetings of the VOAD were used to engage additional stakeholders in the planning effort. In February, the meeting featured a presentation by the new CEO of the Good Samaritan Mission, who provided an update to the Local Emergency Planning Committee (LEPC) on their efforts to strengthen disaster relief support, including plans to expand kitchen and laundry facilities at their shelter and community center. WSP gave a brief overview of the planning process, emphasizing the importance of involving the group and outreach to vulnerable populations. Following the meeting

The April VOAD meeting revisited key points from the February session, stressing the need to enhance emergency notifications to better reach underserved communities, such as Spanish-speaking populations.

The VOAD raised several questions for the teams to explore further regarding vulnerable populations within the planning area. Undocumented individuals, who often work with the Good Samaritan Mission, are particularly vulnerable due to unstable housing and employment conditions. The Good Samaritan Mission also identified additional non-profit organizations in Teton County that support these communities and can play a role in engaging them in the planning process.

An invite to the June HMPC meeting was extended to certain VOAD members and housing agencies/advocacy groups. Other meetings were used to connect with stakeholders and note the plan update effort. These are show in the table below. The Teton Flood Stakeholder Meeting was another opportunity to connect with stakeholders and help inform the planning effort the status of hazards related to flooding and dams. At the meeting, the National Weather Service reported no major flood concerns but noted that conditions depend on the rate of snowmelt. The Safety of Dams Inspection for five dams was also completed, with no issues identified and minimal risk of property damage downstream. The Wyoming Office of the State Engineer Dam Safety division was contacted early in the planning process to provide insight on available dam inundation mapping. This coordination helped inform the dam failure hazard section in Chapter 4 and resulted in clarification on what could and could not be divulged in the public facing HMP document.

Additional coordination and email questionnaires occurred with the Teton Housing Authority and the Teton County floodplain manager.

Table 3-4 Schedule of Other Stakeholder Meetings

MEETING NAME	DATE
VOAD Meeting	2/21/24
VOAD Meeting	4/17/24
Teton Flood Stakeholder Meeting	5/14/24

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is an important aspect of mitigation planning. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability from natural hazards. The County and Town of Jackson use a variety of comprehensive planning mechanisms, such as master plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into these plans establishes a credible and comprehensive HMP that ties into and supports other community programs. The development of this plan incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- County comprehensive plan – informed capabilities assessment, growth and development trends
- Community Wildfire Protection Plan – informed risk assessment, capabilities, mitigation strategies
- Wyoming Hazard Mitigation Plan (2020)-informed risk assessment, goals update.

Other documents were reviewed and cited, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment.

The HMP has also been incorporated by reference in other County and Town planning documents. This is detailed in Section 6.3 Incorporation into Existing Plans and Procedures.

3.3.2 Phase 2: Assess Risks

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

WSP led the HMPC in the effort to identify and document all the hazards that have impacted or could impact the planning area. The existing hazard mitigation plan, and Wyoming Hazard Mitigation Plan provided a basis for many of the hazard profiles. Where data permitted, Geographic Information Systems (GIS) was used to display, analyze, and quantify hazards and vulnerabilities. Sophisticated analyses for flood, landslide and wildfire hazards were performed by WSP that included an analysis of flood risk based on the Digital Flood Insurance Rate Maps (DFIRMs), where available. A more detailed description of the risk assessment process and the results are included in Chapter 4 Risk Assessment.

Also included in the 2025 plan is an updated capability assessment to review and document the planning area's current capabilities to mitigate risk and vulnerability from natural hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC can assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. The results of this assessment are captured in Chapter 2.

3.3.3 Phase 3: Develop the Mitigation Plan

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

WSP facilitated discussion sessions with the HMPC that described the purpose and the process of updating planning goals, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This process was used to update and enhance the mitigation action plan, which is the essence of the planning process and one of the most important outcomes of this effort. The action plan

and the process used to identify and prioritize mitigation actions is described in greater detail in Chapter 5 Mitigation Strategy.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, WSP produced a complete first draft of the Regional Plan. This complete draft was shared for HMPC review and comment; HMPC comments were integrated into the second draft, which was advertised and distributed to collect public input and comments. Other agencies, including Wyoming Safety of Dams Program in the State Engineer's Office, and neighboring county emergency managers (Fremont, Lincoln, Park and Sublette in WY, and Teton, Fremont, and Bonneville counties in Idaho) were invited to comment on this draft as well. WSP integrated comments and issues from the public, as appropriate, along with additional internal review comments, and produced a final draft for the Wyoming Office of Homeland Security and FEMA Region VIII to review and approve, contingent upon final adoption by the governing boards of each participating jurisdiction.

3.3.4 Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

To secure buy-in and officially implement the plan, the plan was adopted by the governing boards of each participating jurisdiction. As the adoption process takes place after FEMA's review and approval of the plan, copies of the adoption resolution will be included electronically in Appendix B Records of Adoption.

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

The true worth of any mitigation plan is in the effectiveness of its implementation. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. Progress on the implementation of specific actions identified in the plan is captured in the mitigation action plan summary table in Chapter 5 Mitigation Strategy. An overall implementation strategy is described in Chapter 6 Plan Adoption, Implementation and Maintenance.

Finally, there are numerous organizations within the Region 8 planning area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is important to the ongoing success of this plan and mitigation in Region 8 and is addressed further in Chapter 6. A plan update and maintenance schedule and a strategy for continued public involvement are also included in Chapter 6.

4 Hazard Identification and Risk Assessment (HIRA)

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

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

This risk assessment builds upon the methodology described in the 2023 FEMA Local Mitigation Planning Handbook, which recommends a five-step process for conducting a risk assessment:

1. Identify Hazards
2. Describe Hazards
3. Identify Community Assets
4. Analyze Risks
5. Summarize Vulnerability

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

Section 4.1 Hazard Identification identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.

Section 4.2 Hazard Profiles discusses the threat to the planning area and describes previous occurrences of hazard events, the likelihood of future occurrences, and the Region's vulnerability to particular hazard events.

4.1 Hazard Identification

Requirement §201.6(c)(2)(i):
[The risk assessment shall include a] description of the type of all natural hazards that can affect the jurisdiction.

4.1.1 Results and Methodology

The 2020 Region 8 HMP considered a total of 11 hazards to profile in the risk assessment for that plan. These include:

- Dam Failure
- Drought
- Earthquake/Liquefaction
- Flood/Flash Flood
- Hail
- Landslide
- Lightning
- Avalanche
- Tornado
- Wildland Fire
- Winter Storm

Using existing hazards data, plans from participating jurisdictions, and input gained through planning and public meetings, the HMPC of Teton County refined this above list of hazards for the plan update. Hazards data from FEMA, the Wyoming Office of Homeland Security (including the 2020 State of Wyoming Multi-Hazard Mitigation Plan), the National Oceanic and Atmospheric Administration, neighboring county hazard mitigation plans, and many other sources were examined to assess the significance of these hazards to the planning area. The

hazards evaluated in this plan include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future.

Each of the hazards previously profiled are still profiled in this HMP update, however some have been renamed or combined with other hazards. The final list of hazards identified and investigated for the 2025 Region 8 Multi-Hazard Mitigation Plan includes:

- Avalanche
- Dam/Levee Incident
- Drought
- Earthquake
- Flood
- Landslide
- Severe Summer Weather (Hail/Extreme Heat/Lightning/Thunderstorms)
- Severe Winter Weather
- High Winds (including Tornado)
- Wildfire

Since the 2020 plan, changes to the hazards list include the addition of levee incidents to the dam incident chapter, and the tornado hazard profile was expanded to evaluate windstorms and microbursts as well. Similarly, hail and lightning are now included in the broader Severe Summer Weather hazard profile, which covers other typical summer weather hazards like extreme heat and thunderstorms.

Members of the HMPC used a hazards worksheet to rate the significance of hazards that could potentially affect the region. Significance was measured in general terms, focusing on key criteria such as the likelihood of the event, past occurrences, spatial extent, and damage and casualty potential.

Table 4-1 Region 8 Overall Hazard Significance Summary Table

HAZARD	GEOGRAPHIC EXTENT	FREQUENCY OF OCCURRENCE	POTENTIAL MAGNITUDE/ SEVERITY	TETON COUNTY OVERALL SIGNIFICANCE
Avalanche	Limited	Highly Likely	Limited	**Medium**
Dam/Levee Incident	Significant	Unlikely	Critical	**Medium**
Drought	Extensive	Likely	Moderate	**Medium**
Earthquake	Significant	Occasional	Catastrophic	**High**
Flood	Limited	Likely	Limited	**High**
Landslide	Limited	Likely	Critical	**Medium**
Severe Summer Weather (Hail/ Extreme Heat/ Lightning/ Thunderstorms)	Limited	Highly Likely	Limited	**Low**
Severe Winter Weather (including Extreme Cold)	Extensive	Highly Likely	Limited	**Medium**
High Winds (including Tornado)	Significant	Likely	Limited	**Medium**
Wildfire	Extensive	Highly Likely	Critical	**High**

Table 4-2 represents the worksheet used to identify and rate the hazards and is a composite that includes input from all the participating jurisdictions. Note that the significance of the hazard may vary from jurisdiction to jurisdiction. In some cases, the priorities changed during the 2024 update based on input from the HMPC. Other changes in the hazard identification list are noted with an asterisk in the table below.

Table 4-2 Region 8 Overall Hazard Significance Summary by Jurisdiction

HAZARD	TETON COUNTY	JACKSON	TETON CONSERVATION DISTRICT	FLAT CREEK WATERSHED IMPROVEMENT DISTRICT	JACKSON HOLE AIRPORT BOARD
Avalanche	Medium	Medium	NA	Medium	NA
Dam/Levee Incident	Medium	NA	Low	NA	NA
Drought	Medium	Medium	Medium	Medium	Medium
Earthquake	High	High	High	High	High
Flood	High*	Medium	Medium	Medium	Medium
Landslide	Medium*	Low	Low	Low	NA
Severe Summer Weather (Hail/Extreme Heat/Lightning/ Thunderstorms)	Low	Low	NA	NA	Low
Severe Winter Weather (Including Extreme Cold)	Medium	Medium	Medium	Medium	Medium
High Winds (including Tornado)	Medium	Low	Low	NA	Low
Wildfire	High	High	High	High	High

*Flood changed from medium to high, landslide low to medium

Other hazards in the Wyoming State Hazard Mitigation Plan were considered but not profiled in the plan because they either were not present, had a very low probability, or did not have a historical record of impact on property or life safety. Those hazards were:

- Expansive Soils
- Land Subsidence
- Windblown Deposits
- Volcanism/Eruption

While the region would be vulnerable to an eruption of the Yellowstone Caldera due to its location in close proximity to Yellowstone National Park, a large-scale eruption would have catastrophic global impacts. Because of the overly long expected occurrence of frequency (greater than 10,000 years) for explosive volcanism at Yellowstone, and the fact that a mitigation plan is not possible for an event of this magnitude, it was not analyzed in this document. However, the influence of the volcano and its geologic processes on local seismic activity is discussed in the earthquake profile.

Other hazards considered during plan update discussions included human-caused ones such as cyber-attacks, terrorism, and hazardous materials incidents. FEMA defines natural hazards as those which are caused by natural events that pose a threat to lives, property, and other assets, such as hurricanes, earthquakes, and tornadoes. Human-caused or technological hazards on the other hand are those which are caused by tools, machines, and substances used in everyday life and/or intentional acts caused by people attacking or damaging what is valuable in a society. Examples include hazardous materials releases, major computer system failures (e.g., 911 system), terrorist attacks, and riots. Human-caused hazards are not required to be addressed per the FEMA planning requirements thus the focus of the plan remains primarily on natural hazards, but these and other hazards may be revisited in future updates.

In the process of evaluating hazards, consideration of hazards which trigger or are triggered by other hazards was given.

Each hazard is profiled in a similar format that is described below:

Hazard Description

This subsection gives a description of the hazard and associated problems, followed by details on the hazard specific to the Region.

Location

This subsection discusses which areas of the Region are most likely to be affected by a hazard event.

- **Limited**: Less than 10% of the planning area
- **Significant**: 10 to 50% of the planning area
- **Extensive**: 50 to 100% of the planning area

Extent (Magnitude)

This subsection discusses the potential magnitude of impacts, or 'extent' as defined by FEMA, from a hazard event. Magnitude classifications are as follows:

- **Catastrophic**—More than 50% of property severely damaged, and/or facilities are inoperable or closed for more than 30 days. More than 50% agricultural losses. Multiple fatalities and injuries. Critical indirect impacts.
- **Critical**—25 to 50% of property severely damaged, and/or facilities are inoperable or closed for at least 2 weeks. 10-50% agricultural losses. Injuries and/or illnesses result in permanent disability and some fatalities. Moderate indirect impacts.
- **Limited**—10 to 25% of area affected. Some injuries, complete shutdown of critical facilities for more than one week, more than 10% of property is severely damaged.
- **Negligible**—Less than 10% of area affected. Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10% of property is severely damaged.

Previous Occurrences

This subsection contains information on historic incidents, including impacts where known. Information provided by the HMPC is included here along with information from other data sources, including the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI – formerly the National Climatic Data Center (NCDC)). and SHELDUS (where information is referenced from the State Hazard Mitigation Plan).

SHELDUS is a county-level data set for the United States that tracks 18 types of natural hazard events along with associated property and crop losses, injuries, and fatalities. In 2014 this formerly free database transitioned into a fee-based service. Due to this and the availability of similar data in NCEI databases it was not used as a resource during the 2023 regional plan update except for when the data was already available.

When available, tables showing county-specific data from the NCEI and SHELDUS databases may be found in each hazard profile.

Probability of Future Occurrences

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrences is categorized into one of the following classifications:

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

The frequency, or chance of occurrence, was calculated where possible based on existing data. Frequency was determined by dividing the number of events observed by the number of years and multiplying by 100. Stated mathematically, the methodology for calculating the probability of future occurrences is:

$$\frac{\textbf{\# of known events}}{\text{years of historic record}} \text{ x100}$$

This gives the percent chance of the event happening in any given year. An example would be three droughts occurring over a 30-year period which equates to 10% chance of that hazard occurring any given year.

Climate Change Impacts

This subsection to the Frequency/Likelihood of Occurrence section discusses the potential impacts of future changing conditions in the climate and how those changes may increase or decrease natural hazards frequency and intensity.

Vulnerability Assessment

Vulnerability is the measurement of exposed structures, critical facilities, or populations relative to the risk of the hazard. For most hazards, vulnerability is a best estimate. Some hazards, such as flood, affect specific areas so that exposure can be quantified, and vulnerability assessments result in a more specific approximation. Other hazards, such as tornados, are random and unpredictable in location and duration that only approximate methods can be applied.

Land Use and Development Trends

This section describes how vulnerability may be changing due to development trends.

Risk Summary

This section summarizes risk within the county according to the area affected, likelihood, and magnitude of impacts. If the hazard has impacts on specific towns, cities, or districts in the region they are noted here, where applicable.

4.1.2 Disaster Declaration History

As part of the hazard identification process, the HMPC researched past events that triggered federal and/or state emergency or disaster declarations in the planning area. Federal and/or state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

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

A USDA declaration will result in the implementation of the Emergency Loan Program through the Farm Services Agency. This program enables eligible farmers and ranchers in the affected county as well as contiguous counties to apply for low interest loans. A USDA declaration will automatically follow a major disaster declaration for counties designated major disaster areas and those that are contiguous to declared counties, including those that are across state lines. As part of an agreement with the USDA, the SBA offers low interest loans for eligible businesses that suffer economic losses in declared and contiguous counties that have been declared by the USDA. These loans are referred to as Economic Injury Disaster Loans.

Fire Management Assistance Grant funding is available to state, local and tribal governments, for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management Assistance declaration process is initiated when a State submits a request for assistance to the Federal Emergency Management Agency (FEMA) Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis and a FEMA decision is rendered in a matter of hours. The Fire Management Assistance Grant Program (FMAGP) provides a 75 percent Federal cost share, and the State pays the remaining 25 percent for actual costs.

Federally declared disasters for Teton County are listed in the Table below. There have not been any state-declared disasters beyond these that have reached the criteria for a federal declaration.

Table 4-3 Federally Declared Disasters in Planning Area

DISASTER NUMBER	DECLARATION DATE	INCIDENT TYPE	TITLE	INCIDENT BEGIN DATE	INCIDENT END DATE
4535	4/11/2020	Biological	Wyoming Covid-19 Pandemic	1/20/2020	5/11/2023
3479	3/13/2020	Biological	Wyoming Covid-19	1/20/2020	5/11/2023
4306	3/21/2017	Severe Storms	Severe Winter Storm and	2/6/2017	2/7/2017

DISASTER NUMBER	DECLARATION DATE	INCIDENT TYPE	TITLE	INCIDENT BEGIN DATE	INCIDENT END DATE
			Straight-line winds		
4007	7/22/2011	Severe Storms	Severe Storms, Flooding, and Landslides	5/18/2011	7/8/2011
2367	7/26/2001	Fire	Green Knoll Wildfire	7/23/2001	8/8/2001

Source: FEMA, https://www.fema.gov/disasters

4.1.3 Assets Summary

Assets inventoried for the purpose of determining vulnerability include people, structures, critical facilities, and natural, historic, or cultural resources. For the regional planning process available GIS databases were utilized. Address Points, Parcels, and Assessor data for Teton County was obtained from the Wyoming Department of Revenue's Property Tax Division in June of 2023; this information provided the basis for building exposure and property types. A critical facilities layer was created through the combination of the 2020 Hazard Mitigation Plan, 2023 Homeland Infrastructure Foundation-Level Data (HIFLD) databases, 2024 National Inventory of Dams, and the 2024 National Bridge Inventory. HIFLD is national geospatial data that is open public domain that can be used to support community preparedness, resiliency, research, and other capacities. A critical facility is defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Where applicable, this information was used in an overlay analysis for hazards such as flood, landslide, and wildfire.

FEMA organizes critical facilities in eight lifeline categories as shown in Figure 4-1.

Figure 4-1 FEMA Lifeline Categories

Source: FEMA Toolkit Version 2.1

These lifeline categories standardize the classification of critical facilities and infrastructure that provide indispensable service, operation, or function to a community. A lifeline is defined as providing indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security. These categorizations are particularly useful as they:

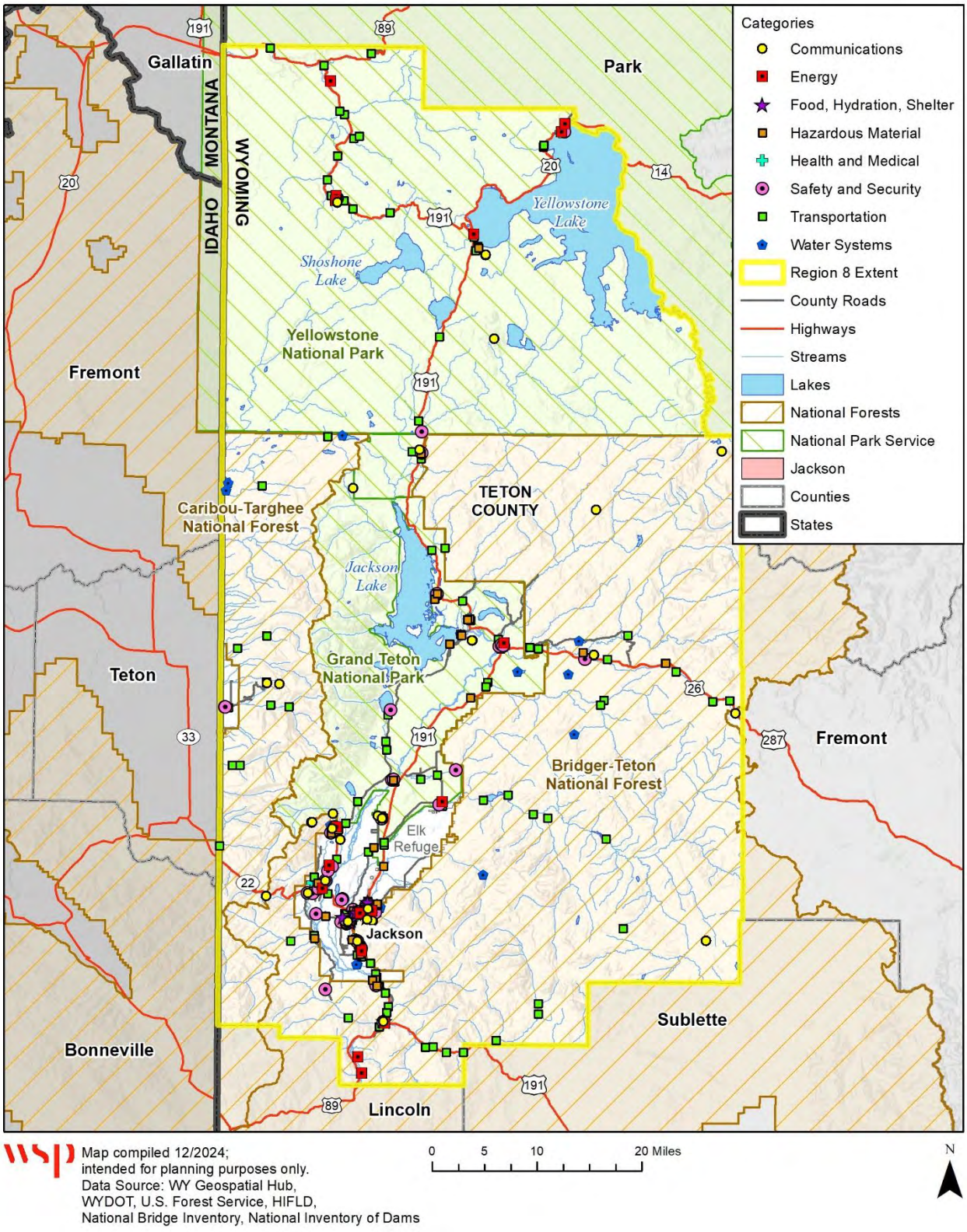
- Enable effort consolidations between government and other organizations (e.g., infrastructure owners and operators).
- Enable integration of preparedness efforts among plans; easier identification of unmet critical facility needs.
- Refine sources and products to enhance awareness, capability gaps, and progress towards stabilization.
- Enhance communication amongst critical entities, while enabling complex interdependencies between government assets.
- Highlight lifeline related priority areas regarding general operations as well as response efforts.

Table 4-4 Region 8 Total Lifeline Facilities by Jurisdiction and Community Lifeline

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	2	3	14	7	26	25	7	1	16	**101**
Unincorporated	38	16	2	41	9	46	108	26	12	**298**
Total	**40**	**19**	**16**	**48**	**35**	**71**	**115**	**27**	**28**	**399**

Source: Teton County, Emergency Management, HIFLD, National Inventory of Dams, National Bridge Inventory, WSP Analysis

Figure 4-2 Critical Facilities Overview Map



Assets specific to the participating special districts were also inventoried during the 2024 update. These are summarized by district in the table below, with potential vulnerability notes:

Table 4-5 Asset Inventory – Special Districts

NAME OF ASSET	APPROXIMATE REPLACEMENT VALUE	HAZARD SPECIFIC CONCERNS
Jackson Hole Airport		
Terminal Building	$103,000,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Control Tower Building	$7,725,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Lighting Control Building	$1,000,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Hangar #1	$2,545,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
QTA – Rental Car Facility	$13,390,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Hangar #2	$3,227,700	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Admin Building- Office Trailer	$477,177	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Hangar #5	$8,940,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Hangar #3	$40,000,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Fuel Facility	$20,000,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Perimeter Fence	$2,000,000	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Vehicle Gates	$164,800	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Lift Station	$353,290	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Parcs System	$566,500	Earthquake, Severe Weather (Summer and Winter), Flood, Tornado/Windstorm, Wildfire,
Teton Conservation District		
TCD Server @ TCD Office	$50,000	While backed up, flooding, fire, or earthquake could quickly diminish TCD's responsiveness with data and information if the TCD Server failed.
Flat Creek Watershed Improvement District		
TOJ Drinking Water Well #5		Wintertime flooding
TOJ Sanitary Sewer Collection System		Wintertime flooding
Public Streets and Pathways		Wintertime flooding
Residential Housing		Wintertime flooding

Source: Plan Update Guide input from districts

Table 4-6 below contains a summary of improved property exposure across Region 8, organized by jurisdiction and property type.

Table 4-6 Region 8 Total Property Exposure by Jurisdiction

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE
Jackson	Com. Vacant Land	4	4	$33,491,798	$33,491,798	**$66,983,596**
	Commercial	856	1,156	$2,323,232,052	$2,323,232,052	**$4,646,464,104**
	Multi-Use	32	65	$17,404,763	$17,404,763	**$34,809,526**
	Res. Vacant Land	12	12	$28,423,181	$14,211,591	**$42,634,772**
	Residential	3,238	3,361	$3,588,540,544	$1,794,270,272	**$5,382,810,816**
	Total	**4,142**	**4,598**	**$5,991,092,338**	**$4,182,610,476**	**$10,173,702,814**
Unincorporated	Agricultural	120	136	$232,472,292	$232,472,292	**$464,944,584**
	Com. Vacant Land	7	107	$1,608,461	$1,608,461	**$3,216,922**
	Commercial	324	403	$923,299,601	$923,299,601	**$1,846,599,202**
	Multi-Use	5	5	$8,952,465	$8,952,465	**$17,904,930**
	Res. Vacant Land	36	38	$66,399,396	$33,199,698	**$99,599,094**
	Residential	6,683	6,750	$18,766,432,349	$9,383,216,175	**$28,149,648,524**
	Total	**7,175**	**7,439**	**$19,999,164,564**	**$10,582,748,692**	**$30,581,913,256**
	Grand Total	**11,317**	**12,037**	**$25,990,256,902**	**$14,765,359,167**	**$40,755,616,069**

Source: Teton County, Wyoming CAMA 2024, WSP GIS Analysis

4.1.4 Social Vulnerability and Community Resilience

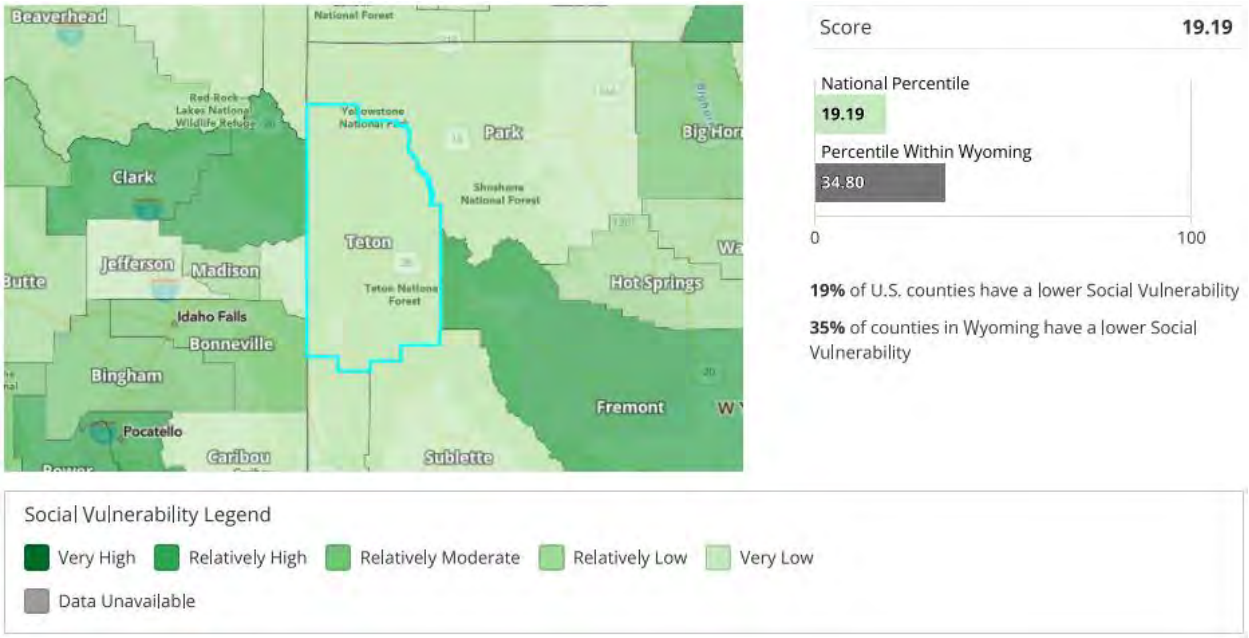
Social vulnerability refers to the increased susceptibility of certain social groups to the adverse impacts of natural hazards. This vulnerability may manifest in disproportionate rates of mortality, injury, loss, or disruption of livelihoods within these communities. Social vulnerability considerations were included in this plan update to identify populations across the planning area that might be more vulnerable to hazard impacts based on a variety of factors.

Community resilience refers to the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand recovery from disruptions. It reflects how well a community can recover after a disaster.

The term vulnerability should be used to describe the communities more vulnerable to a risk or hazard, such as high vulnerability due to wildfires or floods based upon geography, topography, hydrology, or weather. Referencing people themselves directly with the term vulnerability causes individual community members to be seen with a deficit lens, leaving the impression that the vulnerability is a result of a lack of responsibility and/or adequate planning of the individual. Instead, vulnerability only occurs when the system that the individual is part of fails to provide equitable accessibility to resources or services, known as access and functional needs, for the individual to survive, respond to, and recover from an event. Barriers that may be exacerbated by certain social and economic factors – including race, age, income, renter status, or institutionalized living – directly affect a community's ability to prepare for, respond to, and recover from hazards and disasters. The concept of social vulnerability helps explain why communities often experience a hazard event differently, even when they experience the same physical impacts or property loss.

The Centers for Disease Control and Prevention (CDC) has developed a social vulnerability index (SVI) to measure the resiliency of communities when confronted by external stresses such as natural or human-caused disasters. The SVI is broken down by county to the census tract level and provides insight into particularly vulnerable populations. The National Risk Index (NRI) uses the CDC SVI data that can be used as a side-by-side comparison of social vulnerability across the region, Figure 4-3 below displays the overall social vulnerability for region 8. Social groups in Teton County have a Very Low susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.

Figure 4-3 Region 8 Overall Social Vulnerability



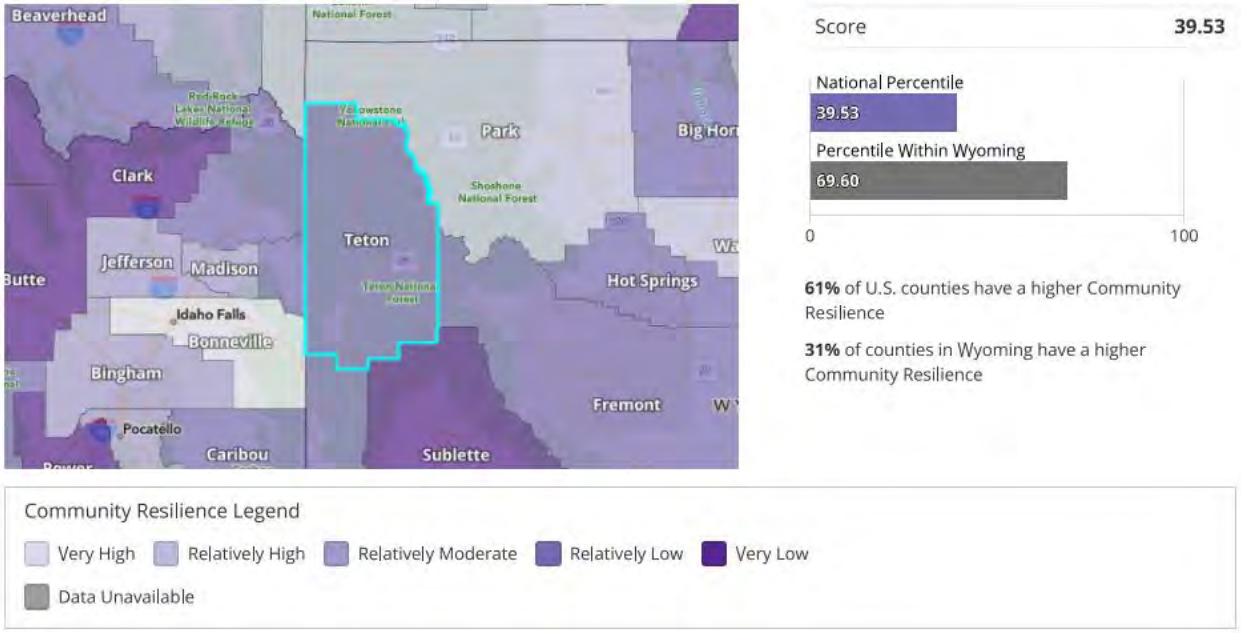
Source: National Risk Index

Related to social vulnerability, the NRI utilizes community resilience as a “consequence reduction component". Community Resilience can essentially be thought of as an inverse to social vulnerability. The NRI defines community resilience as the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions. There are multiple, well-established ways to define community resilience at the local level, and key drivers of resilience vary between locations. Because there are no nationally available, bottom-up community resilience indices available, the Social Vulnerability and Community Resilience Working Group chose to utilize a top-down approach. The NRI relies on using broad factors to define resilience at a national level and create a comparative metric to use as a risk factor.

The Community Resilience score is a consequence reduction risk factor and represents the relative level of community resilience in comparison to all other communities at the same level. A higher Community Resilience score results in a lower Risk Index score. Because Community Resilience is unique to a geographic location—specifically, a county—it is a geographic risk factor. Community resilience data are supported by the University of South Carolina’s Hazards and Vulnerability Research Institute (HVRI) Baseline Resilience Indicators for Communities (BRIC). HVRI BRIC provides a sound methodology for quantifying community resilience by identifying the ability of a community to prepare and plan for, absorb, recover from, and more successfully adapt to the impacts of natural hazards. The HVRI BRIC dataset includes a set of 49 indicators that represent six types of resilience: social, economic,

community capital, institutional capacity, housing/infrastructure, and environmental. It uses a local scale within a nationwide scope, and the national dataset serves as a baseline for measuring relative resilience. The data can be used to compare one place to another and determine specific drivers of resilience, and a higher HVRI BRIC score indicates a stronger and more resilient community. Figure 4-4 below shows the community resilience rating for Teton county.

Figure 4-4 Region 8 Community Resilience Rating



Source: National Risk Index

4.2 Hazard Profiles

4.2.1 Avalanche

Description

An avalanche refers to the rapid movement of a mass of snow down a slope, often triggered by severe weather conditions, posing a threat to people's safety, and causing damage. While most avalanches in Wyoming occur in mountainous regions above the timberline and in sheltered areas where snow tends to accumulate, they can also happen on gentler slopes below the timberline, like gullies or road cuts. Four essential factors contribute to avalanche formation: slope, snow cover, a weak layer within the snowpack, and a trigger mechanism.

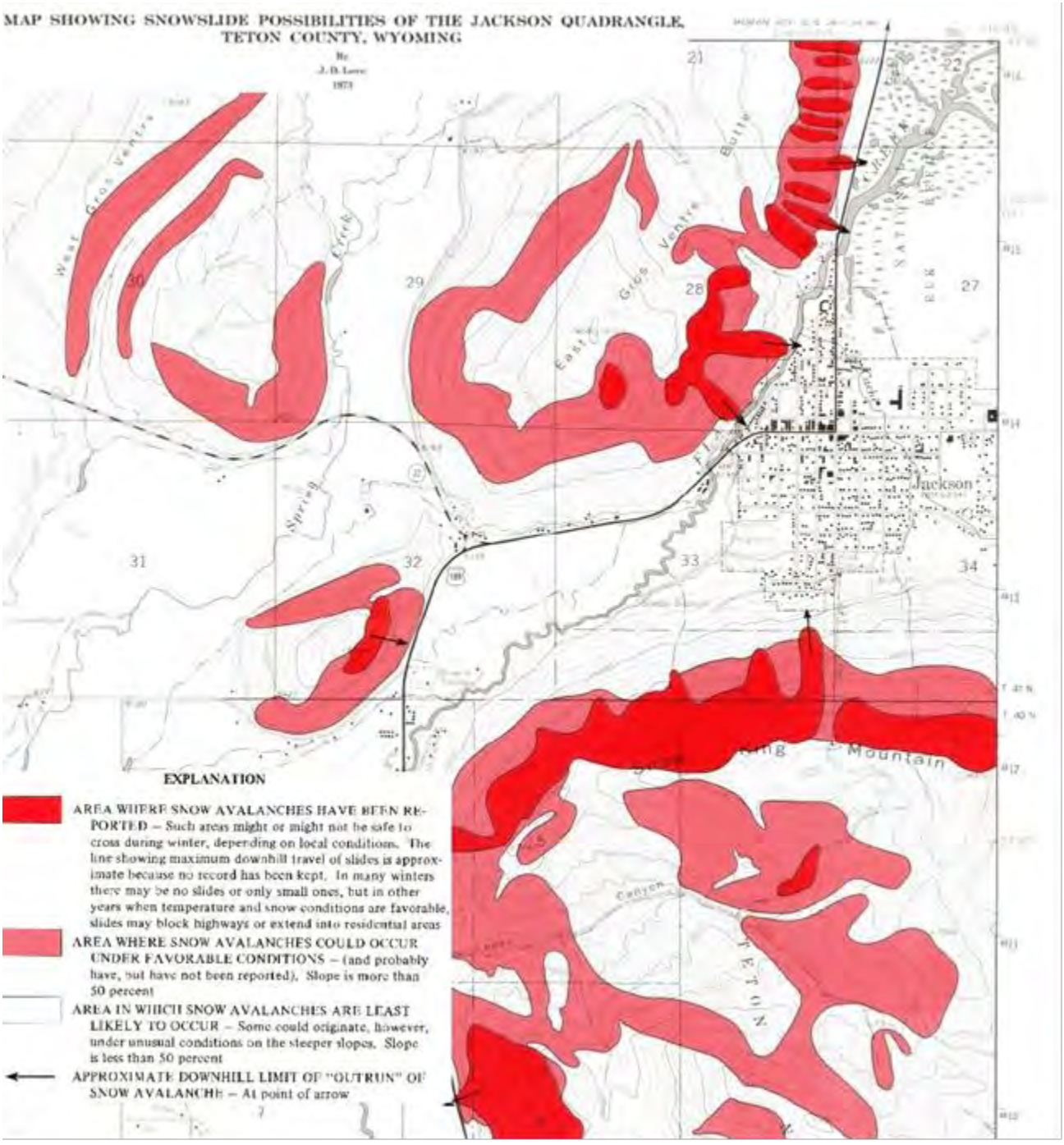
Weak layers within the snowpack fail to support the weight above, leading to the collapse of the snow cover and its rapid downhill movement. Avalanches can release either as loose snowslides and can be categorized as wet or dry depending on the moisture content of the snow. Loose avalanches involve deeper layers of snow losing cohesion due to failure of lower, weaker layers. Both types can travel long distances on gentle terrain, causing damages to buildings, cabins, and infrastructure, such as electrical transmission lines. Avalanches are triggered by human activity or environmental factors like wind loading, precipitation, or temperature changes. Human-triggered avalanches commonly occur in backcountry areas where skiers, hikers, or other outdoor enthusiasts venture.

An avalanche path typically consists of a starting zone where the avalanche initiates, a track where it gains speed and momentum, and a turnout zone where it slows down and debris accumulates. While many avalanches do not result in significant damage, the risk is heightened when people or property intersects their paths. Communication and transportation networks face the greatest risk, along with winter recreationists. Increased development in mountainous regions and the popularity of winter sports have heightened the risk of avalanches. Due to its rural nature, snowpack, varied terrain, and mountain recreational activities, Wyoming is among the states with the highest avalanche hazards.

Location

In Teton County, avalanches are more common in mountainous terrain above the timberline and in leeward slopes where snow tends to accumulate. About 90% of all avalanches start on slopes of 30-45 degrees; about 98% of all avalanches occur on slopes of 25-50 degrees. Avalanches are more prevalent in Teton County compared to the Town of Jackson, simply because more avalanche-prone areas exist outside of the Town. According to the U.S. Geological Survey, the Town of Jackson is vulnerable to multiple areas of avalanche (see Figure below). It is important to note that this data is from 1973; digital information for the Jackson area and County was not available. County Emergency Management noted a resource for avalanche location is the WYDOT District 3 Snow Avalanche Atlas for Lincoln, Sublette, and Teton Counties, compiled in 2004, that contains photos and descriptions of paths crossing highway infrastructure. In the Town, the primary areas of risk are associated with Snow King Mountain, including the ski area and the steeper slopes that flank the ski resort to the east and west. However, avalanches have occurred on east slope of the East Gros Ventre Butte. According to local emergency management these have temporarily dammed Flat Creek, causing flooding issues, and damaged parked vehicles. The more expansive county lands include countless avalanche paths in the Teton and Absaroka Ranges and the Gros Ventre Mountains, including areas along Teton and Togwotee passes. Areas of increased activity by backcountry users (skiers, snowboarders, snowshoers, and snowmobilers) exist along the passes as well as adjacent to both Jackson Hole Mountain Resort (JHMR) and Grand Targhee Mountain Resort, where gated access to backcountry areas sees prevalent skier traffic.

Figure 4-5 Snowslide Possibilities of Jackson Quadrangle Teton County, Wyoming



Source: USGS J.D. Love 1973

Extent (Magnitude)

A number of weather and terrain factors determine avalanche magnitude and severity.

- Weather:
  - Storms – A large percentage of avalanches occur during and shortly after storms.

  - Rate of snowfall – Snow falling at a rate of 1 inch or more per hour significantly increases avalanche danger.
  - Temperature – Storms starting with low temperatures and dry snow, followed by rising temperatures and wet snow, are more likely to cause avalanches than storms that start warm and then cool.
  - Wet snow –Spring weather with warm, moist winds and cloudy nights, as well as rainstorms, can cause wet snow avalanches by warming the snowpack and decreasing its strength. Wet snow avalanches are more likely to occur on sun-exposed terrain and under exposed rocks or cliffs.
- Terrain:
  - Ground cover – Large rocks, trees, and heavy shrubs anchor snow.
  - Slope profile – Dangerous slab avalanches are more likely to occur on convex slopes.
  - Slope aspect – Leeward facing slopes are dangerous because windblown snow adds depth and creates dense slabs. South-facing slopes are more dangerous in the springtime.
  - Slope steepness – Avalanches are most common on slopes of 30 to 45 degrees.

Additional factors contributing to avalanche hazard are old snow depth, old snow surface, new snow depth, new snow type, density, precipitation intensity, settlement, wind direction and speed, temperature, and subsurface snow crystal structure.

The exponential force and volume of snow involved in an avalanche can bury victims under tons of debris. Mitigation measures, including avalanche forecasting, monitoring, and safety protocols, can help minimize the impact of avalanches and protecting lives and property.

There are two distinct scales for measuring avalanche magnitude which include the Relative Size Scale, or R-Scale, and the Destructive Size Scale, or D-scale. Both scales are qualitative tools that aid in communicating avalanche activity, reporting events, and analyzing historical occurrences. While they offer some structure for assessing avalanche magnitude, the scoring along these scales remains subjective and relies on consistency among observers to ensure accurate estimates of magnitude. The R-scale provides a straightforward estimate of avalanche size based on volume relative to the path in which it occurs. Avalanches up to R5 and D4 are possible in the county

Table 4-7 R-Scale Scoring

SCORE	DESCRIPTION
R1	Very small, relative to path
R2	Small, relative to path
R3	Medium, relative to path
R4	Large, relative to path
R5	Major/Maximum, relative to path

Source: Thompson Pass

The D-Scale evaluates the destructive capacity of an avalanche. Occasionally, half-sizes are included in this scale, and it incorporates elements for both mass and path length corresponding to each score along the scale. It is a possibility for avalanches up to a D4 to occur in Teton County.

Table 4-8 D-Scale Scoring

SCORE	DESCRIPTION	TYPICAL MASS	TYPICAL LENGTH
D1	Relatively harmless to people	< 10 Tons	10 Meters
D2	Could bury, injure, or kill a person	100 Tons	100 Meters
D3	Could bury and destroy a car, damage a truck, destroy a wood frame house, or break a few trees	1,000 Tons	1,000 Meters
D4	Could destroy a railway car, large truck, several buildings, or a substantial amount of forest	10,000 Tons	2,000 Meters
D5	Could gouge the landscape-largest snow avalanche known.	100,000 Tons	3,000 Meters

Source: Thompson Pass

Previous Occurrences

Avalanches occur frequently in the County. However, due to isolated nature of these incidents few avalanches are widely recorded. Still, avalanches have the capability to incur major damages when people are involved, and Teton County is especially susceptible due to its mountainous terrain and popularity among winter recreationists.

According to Bridger-Teton Avalanche Center, there were 33 fatalities related to avalanches between 1964-2023.

Table 4-9 Avalanche Fatalities in Teton County, 1964-2023

COUNTY	LOCATION	DATE	ACTIVITY/TRAVEL	NUMBER OF FATALITIES
Teton	Snow King Mountain	12-Mar-64	Patroller	1
Teton	Glacier Gulch, Teton Range	16-Jan-74	Backcountry Skier	1
Teton	Glacier Gulch, Teton Range	16-Jan-74	Backcountry Skier	1
Teton	Glacier Gulch, Teton Range	16-Jan-74	Backcountry Skier	1
Teton	South Leigh Canyon, Teton Range	20-Mar-76	Backcountry Skier	1
Teton	Grand Teton, Teton Range	26-Apr-79	Climber	1
Teton	Grand Teton, Teton Range	26-Apr-79	Climber	1
Teton	Ferrin's Slide, Snow King Mt	16-Feb-84	Lift Skier Out of Area	1
Teton	Mt Wister, Teton Range	3-Feb-85	Climber	1
Teton	Rendezvous Mountain, Teton Range	2-Dec-85	Patroller	1
Teton	Rendezvous Mountain, Teton Range	17-Feb-86	Patroller	1
Teton	Dry Ridge, Teton Range	28-Feb-92	Snowmobiler	1
Teton	Simpson Peak, Togwotee Pass	28-Dec-92	Backcountry Skier	1
Teton	Taylor Mountain, Teton Range	19-Apr-95	Backcountry Skier	1

COUNTY	LOCATION	DATE	ACTIVITY/TRAVEL	NUMBER OF FATALITIES
Teton	Factory Hill, Yellowstone	3-Mar-97	Backcountry Skier	1
Teton	Factory Hill, Yellowstone	3-Mar-97	Backcountry Skier	1
Teton	Dry Lake Creek, Togwotee Pass	4-Jan-99	Snowmobiler	1
Teton	Rendezvous Mountain, Teton Range	19-Jan-99	Lift Skier	1
Teton	Glory Bowl, Teton Range	1-Dec-00	Backcountry Snowboarder	1
Teton	Titmouse Ridge, Teton Pass	9-Dec-00	Backcountry Skier	1
Teton	Pyramid, Teton Range	19-Jan-16	Backcountry Snowboarder	1
Teton	Ralph's Slide, Teton Range	24-Jan-16	Lift Skier Out of Area	2
Teton	Fred's Saddle Backside, Teton Range	21-Feb-16	Lift Skier Out of Area	1
Teton	Steve Baugh Bowl, Teton Range	23-Dec-16	Lift Snowboarder Out of Area	1
Teton	East Leidy Mountain, Togwotee Pass	22-Apr-18	Snowmobiler	1
Teton	Mt Leidy, Togwotee Pass	9-Jan-19	Snowmobiler	1
Teton	Breccia Cliffs Area, Togwotee Pass	4-Mar-19	Snowmobiler	1
Teton	Taylor Mountain	1-Apr-20	Snowboarder	1
Teton	Austin Canyon	3-Apr-20	Snowmobile	1
Teton	Togwotee Pass	18-Feb-21	Snowmobile	1
Teton	Peak 9775, Teton Range	22-Feb-21	Snowboarder	1
Teton	South Fork of Game Creek	17-Mar-22	Backcountry Skiing	1
Teton	Poker Flats	23-Feb-23	Snowmobile	1

Source: Bridger-Teton Avalanche Center, https://bridgertetonavalanchecenter.org/wyoming-fatalities-by-date-list/

Probability of Future Occurrences

Avalanches are most likely to occur between November and April, with the January, February, and March being the peak months. Snow avalanches may stop in the starting zone, track, or run-out zone, depending on the amount and condition of the snow in the path. Bridger-Teton Avalanche Center has helped forecast and identify avalanche risks throughout the area. By utilizing this tool, outdoor enthusiasts and others participating in activities that may be at risk of avalanches, are able to receive up-to-date information on weather conditions, snow stability, and avalanche dangers ratings for the area.

Teton County's mountainous terrain and winter climate can make it inherently prone to avalanches that will recur multiple time annually, especially in areas with steep slopes and heavy snow accumulation. As human activity increases in avalanche-prone regions the likelihood of triggering avalanches may also rise. Bridger-Teton Avalanche Center has reported approximately 33 deaths related to avalanches since 1964 throughout Teton County. This is approximately 0.56 fatalities per year in the last 59 years. This is a slight decrease from 2.2 fatalities per year on average noted in the 2015 version of this plan. The probability of future occurrences in Teton County is rated as **Highly Likely**.

Climate Change Impacts

As precipitation patterns tend toward more extremes, the frequency of avalanches may be expected to increase. Many avalanches take place following unusually heavy snowfall that occurs in a short period of time. Scattered snowfall early in winter may result in an increase in

avalanche activity by creating a thin snowpack that becomes structurally weaker as winter progresses. New layers of snow may not bond well to the weak base layer at the bottom of the snowpack, creating prime conditions for avalanches. Similar conditions in early to mid-spring may replicate this process, leading to increased avalanche activity as snow accumulation has already begun to thaw with the warmer season. In other words, as more snow piles on top of the weak layer, and temperatures remain warm, the upper moisture-laden layers become vulnerable to sliding.

Increasing temperatures will also result in more precipitation falling as rain instead of snow. Over time this may decrease the risk of avalanche due to a dramatically reduced snowpack. However, this could result in more wet snow avalanches from rain on snow events.

Vulnerability Assessment

Areas within Teton County and the Town of Jackson where avalanche activity intersects with recreational activities, transportation routes, and infrastructure pose the greatest risks. In Teton County areas of steep slopes near WY Highway 22 over Teton Pass and US Highway 26 over Togwotee Pass frequented by winter backcountry enthusiasts such as skiers, snowboarders, snowmobilers, and snowshoers are considered high-risk zones.

PEOPLE

Life safety is most threatened by this hazard with the potential for deaths and injury (approximately 2 deaths per year on average). Outdoor recreationists who travel into backcountry areas are at most risk. Additionally, avalanche incidents involving search and rescue teams can put these personnel at risk. The key actions to limiting impacts to individuals recreating in avalanche prone areas include spreading knowledge and awareness of the hazard and being properly equipped for self-rescue. Risk to motorists on Highway 22 over Teton Pass is controlled through WYDOT periodic closures for avalanche mitigation during times of high avalanche potential. Socially vulnerable populations are not more at risk to avalanches, but there is concern for those who live in surrounding areas and must commute to work due to high housing costs and low housing availability within the region This causes local workers to have to travel from surrounding towns through passes and canyons that can be shut down due to avalanches.

BUILT ENVIRONMENT

In the Town of Jackson, key concerns lie in regions along the western to northern slopes of Snow King Mountain, where some development has taken place along its base. Other areas by Jackson include the East Gros Ventre Butte above Flat Creek, below which lies some commercial and residential development.

ECONOMY

Transportation networks are limited in the region and vulnerable to avalanches. Transportation obstruction due to avalanche can temporarily prevent the transportation of goods, as well as disrupt commuting and emergency response and service provision. Thus, periodic economic impacts are expected annually. Pre-emptive closures of these roads by officials for avalanche mitigation or due to high avalanche danger also occur but are in the interest of public safety.

CRITICAL FACILITIES AND LIFELINES

Infrastructure elements such as roads in the county are susceptible to avalanches, leading to disruptions in transportation. Teton County noted that avalanches can temporarily shut down major highways such as Highway 22 (Teton Pass), South Highway 89 (Rafter J area, Snake River Canyon), North Highway 89 (National Wildlife Art Museum area) and Highway 191 (Hoback Canyon) (Teton County Wyoming, 2024). Teton pass is periodically closed in winter for avalanche safety and mitigation. There are very limited alternative detour options when these happen. County Emergency Management in 2024 noted a trend towards more county roads being affected by avalanches in recent years, with an incident on Spring Gulch Road in the

winter of 2024. Avalanches also have capacity to affect power line, communications, and natural gas pipe infrastructure, but the extent of exposure and risk to this infrastructure is unknown.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

Avalanches are a natural process in landscapes where they occur. However, large avalanches may alter the natural landscape, damaging tress and in some cases removing areas of forest and creating piles of woody debris. Loss of vegetation on the mountains may expose soil, leading to secondary impacts such as landslides and debris flows. Snow removal and storage from large avalanches can also be a logistical challenge.

Land Use and Development Trends

No specific new growth or development within the County, Town of Jackson, or the Teton Conservation District in the past five years has significantly altered the county's avalanche risk. Snow King Mountain and Jackson Hole Mountain Resort adhere to Resort Master Plans, which delineate proposed development and redevelopment areas while also managing growth and development to safeguard users and steer clear of natural hazard zones. The Jackson-Teton County Comprehensive Plan Policy 3.4.b aims to "protect Development Against Avalanches and Landslides" and underscores the risk of avalanches displacing buildings or entrapping occupants. The policy recommends restricting development within 100-year avalanche paths and installing mitigation measures where development occurs within these zones. A large portion of Teton County that is prone to avalanches is within National Forests and National Parks, meaning that there are limited buildable areas. Due to these factors direct avalanche vulnerability to structures is very limited and has not increased since the last plan update.

Risk Summary

In summary, the avalanche hazard is rated as **medium** significance for Teton County. Variations in risk by jurisdiction are summarized in the table below, as well as key issues form the vulnerability assessment.

- Overall, avalanches are rated as a **medium** significance in the planning area.
- Avalanches cause two primary impacts hazards in Teton County: roadblocks and risk to human life, primarily backcountry users.
- Historically, there has been at least one fatality due to avalanche annually, making the likelihood of future occurrence **Highly Likely**.
- Updated avalanche mapping was noted as a need during the 2024 planning effort.
- Due to the remote location of most avalanches economic impacts are generally minor; therefore, magnitude is **limited**.
- Winter recreationists and first responders are most likely to be affected by avalanches, although rare urban avalanches have occurred.
- Additionally, as a popular backcountry recreation spot for visitors, a high risk exists for individuals unfamiliar with recognizing avalanche terrain.
- Related hazards: Severe Winter Weather, Windstorm, Flood

Table 4-10 Risk Summary by Jurisdiction: Avalanche

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	Medium	Widespread backcountry areas and transportation corridors in risk areas; some county roads affected.

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
Town of Jackson	High	Three entry/exit points to the town are at high risk of cutting off access to the town if an avalanche were to occur.
Teton Conservation District	NA	Not considered to have risk to District facilities/assets
Flat Creek Watershed Association	Medium	Some potential to temporarily dam the creek and cause flooding. An avalanche occurring in the area upstream of the Flat Creek Water Improvement District could cause flooding issues in the watershed and surrounding areas.
Jackson Hole Airport	NA	No steep slopes

4.2.2 Dam/Levee Incident

Description

Dams are barriers constructed across a watercourse that stores, controls, or diverts water. They're designed for a variety of uses, including flood protection, power, agriculture and irrigation, water supply, and recreation. They're typically composed of earth, rock, concrete, or mine tailings. The water impounded behind a dam is referred to as the reservoir and is usually measured in acre-feet, with one acre-foot being the volume of water that covers one acre of land to a depth of one foot. Dams and reservoirs serve a very important role for Wyoming residents and industry. However, there is the risk that dams can fail, either completely or partially, and become a significant hazard for those downstream.

Dam incident refers to the uncontrolled release of impounded water, resulting in downstream flooding that can affect life and property. Several factors that influence the potential severity of a full or partial dam failure, including the volume of water impounded, the type of dam, and amount of development and infrastructure located downstream.

Dam failure occurs when the dam's capacity to retain water is compromised, in part or in its entirety. These failures can be triggered by various factors or sources, including:

- Prolonged periods of rainfall and flooding, which result in overtopping
- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage or piping or animal activity
- Improper design
- Age
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway
- Vandalism or terrorism

Other unforeseen failures can result from unusual events like seismic activity (earthquakes), deliberate acts of sabotage or vandalism, or complex, multifaceted causes. These failures can be challenging to predict and prevent due to their diverse and often unexpected nature.

It's important to note that dam emergencies are not solely restricted to complete dam failure. Large spillway discharges that can cause downstream flooding or flooding upstream due to

backwater effects or high-water levels are also considered dam emergencies, potentially resulting in substantial property damage and loss of life.

In addition to dams, Teton County also has levees that pose flood risks. A levee is an earthen embankment constructed along the banks of rivers, canals, and coastlines to protect adjacent lands from flooding by reinforcing the banks. However, by confining the flow, levees can also increase the speed of the water. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. Levees can *reduce* the risk to individuals and structures behind them, but they do not eliminate risk entirely. Levees are designed to protect against a specific flood level; severe weather could create a higher flood level that the levee cannot withstand. When levees, floodwalls, and their auxiliary structures are stressed beyond their capabilities to withstand floods, levee failure can result in loss of life and injuries as well as damages to property, the environment, and the economy. For purposes of this discussion, levee failure will refer to both overtopping and breach of a levee as defined in the U.S. Army Corps of Engineers' Publication - *So You Live Behind a Levee!* (https://www.spl.usace.army.mil/Portals/17/SoYouLiveBehindLevee.pdf).

- **Overtopping** occurs when floodwaters exceed the height of a levee and flow over its crown. As the water passes over the top, it may erode the levee, worsening the flooding and potentially causing an opening, or breach, in the levee.
- **Breaching** - A levee breach occurs when part of a levee gives way, creating an opening through which floodwaters may pass. A breach may occur gradually or suddenly. The most dangerous breaches happen quickly during periods of high water. The resulting torrent can quickly swamp a large area behind the failed levee with little or no warning.

Location

In 1981, the U.S. Army Corps of Engineers completed an inspection program for nonfederal dams under the National Dam Inspection Act (P.L. 92-367). This was a four-year work effort and included compiling an inventory of about 50,000 dams and conducting a review of each state's capabilities, practices, and regulations regarding design, construction, operation, and maintenance of dams. Part of the inspection included evaluating the selected dams and assigning a hazard potential based on the effects downstream, should one of the dams fail. The dams were rated (1) High, (2) Significant, and (3) Low hazard, just like the classification adopted by FEMA. The Corps of Engineers based the hazard potential designation on such items as acre-feet capacity of the dam, distance from nearest community downstream, population density of the community, and age of the dam**.**

The Wyoming State Engineers Office (WSEO) inspects dams over 20 feet high or with a storage capacity of 50 acre-feet or more, although smaller dams are also inspected in highly populated areas. As a part of the regulatory process, the WSEO inspects these dams once every five years.

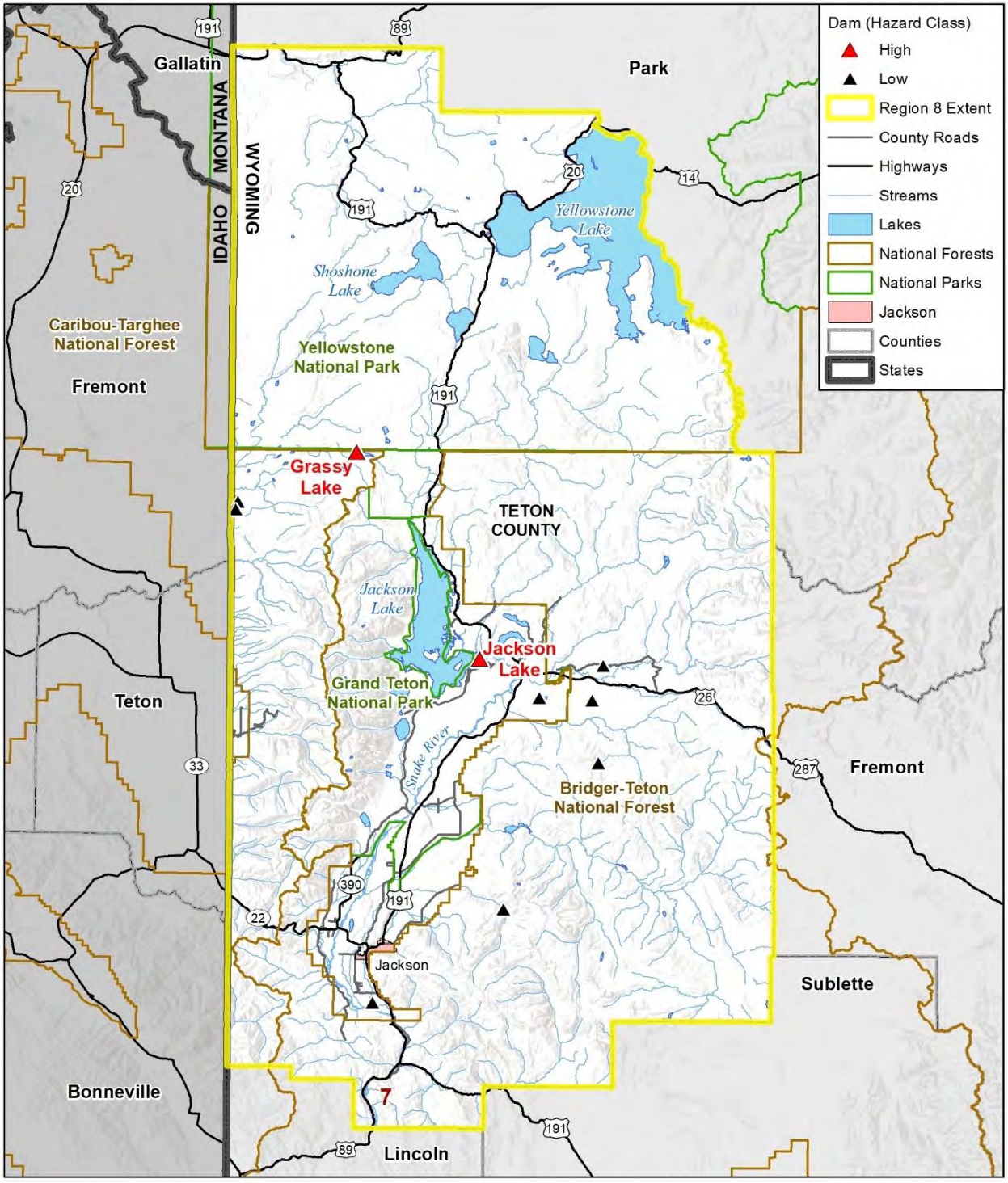
There are currently 1,495 dams in Wyoming shown in the Army Corps of Engineers' National Inventory of Dams (http://nid.usace.army.mil). Teton County has 10 dams that are inspected by the Wyoming State Engineer's Office. The average age of these dams is 73. Of the 10, two dams are considered high hazard, the rest are low hazard dams. The high hazard dams are Jackson Lake (including Jackson Lake North and South Dikes) and Grassy Lake dams, which both are federally owned and have emergency action plans on file. The primary purposes of Jackson Lake are flood control and irrigation storage, while the primary purpose of Grassy Lake is irrigation storage. Table 4-11 provides details of the dams in Teton County.

Teton County also has a network of levees that play a crucial role in managing water flow and mitigating flood risks The Teton County Road and Levee Division collaborates with the Army Corp. of Engineers, stationed in Walla Walla, WA. The Snake River and Gros Ventre Levee System have 24.5 miles of levees along the Snake and Gros Ventre Rivers in Teton County. The

levee system begins approximately 11 miles south of Jackson Lake, from slightly downstream of the town of Moose and extends downstream nearly to the South Highway 89 bridge over the Snake River south of South Park (see Section titled *Vulnerability Assessment*). These 24.5 miles of levees were built by the Corps of Engineers and are maintained by Corps of Engineers with assistance from Teton County. There are some private levees that were built and are maintained by private landowners. These levees play a crucial role in flood management, protecting the area from potential flood damage, especially during periods of high-water flow.

The Army Corps of Engineers comes to Jackson Hole in July of each year to complete an inspection of the levees. This ensures the levees remain effective in protecting the community. During this inspection, the Fall Rehabilitation Schedule is decided by evaluating the amount of riprap lost during the spring runoff. The Fall Rehab is completed in October, which is when the Snake River is at its lowest. (https://www.tetoncountywy.gov/555/Levee-Systems-Facts).

Figure 4-6 Teton County Dams



Map compiled 4/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, U.S. Forest Service,
National Inventory of Dams

Table 4-11 Dams in Teton County

NAME	HAZARD LEVEL	OWNER	PRIMARY PURPOSE	YEAR COMPLETED	RIVER	NEAREST DOWNSTREAM COMMUNITY (DISTANCE TO COMMUNITY)
Grassy Lake	High	Bureau of Reclamation	Irrigation	1938	Grassy Creek	St. Anthony, Idaho (53 mi)
Jackson Lake	High	Bureau of Reclamation	Flood Control	1911	North Fork Snake River	Moose (23 mi)
Indian Lake	Low	Squirrel Creek Irrigation Company	Irrigation	1954	Indian Lake Basin	St. Anthony, Idaho (36 mi)
Tracy Lake	Low	Fir Creek, LLC	Recreation	1928	Randolph Creek	Moose (24 mi)
Bergman Lake	Low	Ronald Bergman	Irrigation	1953	Indian Creek	St. Anthony, Idaho (35 mi)
Porter	Low	Leeks Canyon Ranch, LLC	Irrigation	1951	Wallace Creek	Moose (22 mi)
UHL	Low	Jack e. Stark, Grand Teton National Forest	Irrigation; Fish and Wildlife Pond	1948	Spread Creek	Moose (17 mi)
Flat Creek Ranch	Low	Homestead Company, LLC.	Fish and Wildlife Pond	1967	Flat Creek	N/A
Jackson Wastewater Treatment Plant ENL.	Low	Town of Jackson	Debris Control	1980	Snake River Off stream	Hoback (14 mi)
Leidy lake	Low	Wyoming Game and Fish Department	Fish and Wildlife Pond	1983	Leidy Creek	Moose (42 mi)

Source: National Inventory of Dams

Extent (Magnitude)

Dam failures result in a unique source of flash flooding, when a large amount of previously detained water is suddenly released into a previously dry area due to a failure in some way of the dam. Dams are organized into three classes. The State of Wyoming has adopted FEMA's risk classifications as set forth in FEMA's Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams. These guidelines define High Hazard (Class I) dams as those rated based on an expected loss of human life, should the dam fail, and Significant Hazard (Class II) dams as those rated based on expected significant damage, but not loss of human life. Significant damage refers to structural damage where humans live, work, or recreate, or public or private facilities exclusive of unpaved roads and picnic areas. Damage refers to making the structures inhabitable or inoperable. Low hazard dams would have minimal downstream impacts from a failure.

Levee failures also can occur suddenly and cause extensive loss of life and/or property. Advance warning of possible failure, and the potential for evacuation, depends on the mode of failure and preparedness of emergency managers. For example, if heavy precipitation occurs with the potential to cause runoff sufficient to overtop levees, evacuation may be possible. However, this is not always the case. Levee failures can also cause secondary hazards downstream, including extensive flooding, heavy erosion and sedimentation, and landslides.

The severity and magnitude of a given dam or levee incident will vary greatly on a case-by-case basis depending on a wide variety of factors, such as the level of development and population in the inundation area and the degree of the dam incident. In general, for the purposes of this plan, the extent is considered **critical** due to the presence of two High Hazard dams. There is potential for severe impacts to occur, however unlikely they may be. Information on potential impacts of specific failures to particular dams is considered sensitive and is not detailed in this plan due to the State Engineer for Wyoming Safety of Dams Program concerns. However, emergency management coordinators have access to inundation maps contained in the emergency action plans for the High and Significant Hazard dams in the state. Currently, there are no High Hazard dams outside of Teton County that would be any threat to property or population.

Potential impacts could include injury and loss of life, property damage, damage to infrastructure, drinking water contamination, loss of crops and livestock, evacuations, sheltering, and associated costs, interruption of commerce and transportation, search and rescue, and clean-up costs. In addition, dam incidents and associated flooding can cause damage to and loss of irrigation structures such as headgates and ditches. Loss or damage to water structures negatively impacts agricultural producers of crops and livestock—and can be costly to repair.

Loss of Life determinations are highly influenced by three factors: the number of people occupying the dam or levee inundation area, the amount of warning that is provided to the people exposed to dangerous flooding, and the severity of the flooding. There is the potential for loss of life downstream of the high hazard dams in the County, but also potential lead time for warning and evacuation due the distance the water would need to travel before populated areas would be impacted.

Jackson Lake Dam impounds about ¼ cubic mile of water behind a 65-ft tall dam structure. The Snake River downstream from the dam is relatively steep (~10 ft/mile drop) and has a well-defined valley. A catastrophic failure of the Jackson Lake Dam could result in very high flood depths moving at a high rate of speed, causing impacts on the high end of what is described above to areas of the unincorporated county.

Previous Occurrences

Teton County has one documented dam failure-type incident related to a landslide dam that resulted in the infamous Kelly Flood. On June 23, 1925, part of the northern face of Sheep Mountain became unstable after weeks of heavy rain and slid into the Gros Ventre River. The 50 million cubic yards of sedimentary rock formed a natural dam 200 feet high and 400 yards wide that created Lower Slide Lake. On May 18th, 1927, a portion of the natural dam broke during a spring with heavy runoff causing a flash flood to rush down the Gros Ventre River. The flood was at least six feet deep for at least 25 miles downstream and wiped out the town of Kelly six miles downstream. Six people died, and many others lost everything they owned. Fifteen miles downstream in Wilson, six feet of water inundated the town and hundreds of farm animals died. There was heavy livestock loss, ranger buildings were destroyed, irrigation head gates were washed away, and a bridge was washed out ($75,000 to $150,000 damage). The American Red Cross had expenditures of $12,201. In narrower sections of the Snake River near Hoback, flood waters rose as much as 50 feet. The next day the waters reached Idaho Falls, Idaho and covered lowland sections there.

The American Red Cross, Wyoming State Government, Wyoming Governor Emerson, and the Highway Department responded. Total damages surpassed $500,000. You can still see the bald rock on the north face of Sheep Mountain (Sleeping Indian) as a reminder of this tragic event.

Additionally, the LEPC noted that a landslide dam was created on Crystal Creek by the Crystal Peak landslide in 2008 in an area that has seen recurring landslides in the Bridger-Teton National Forest.

The impact from Kelly flood incident in Teton County was significant, equivalent to $6.7 million in 2015 dollars. Lives lost in 1927 were partly due to attempts to save belongings or not heeding warnings.

No levee failures have occurred in Teton County.

Probability of Future Events

Dam failures in the United States typically occur in one of four ways:

- Dam overtopping occurs when the water level behind the dam exceeds the top of the dam. Overtopping accounts for 34% of all dam failures, and can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30% of all dam failures.
- Internal erosion of piping of an earth dam takes place when water that seeps through the dam carries soil particles away from the embankment, filters, drains, foundation, or abutments of the dam. Failure due to piping and seepage accounts for 20% of all failures.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10% of all failures.

The remaining 6% of U.S. dam failures are due to miscellaneous causes. Many dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage, foundation failures, and sabotage.

Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are

serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

Levee failures are largely similar in cause to dam failures and overtopping is an especially important concern. The relatively long nature of levee structures creates extensive opportunity for failures to occur. This amplifies the resources needed to maintain a reasonable inspection and maintenance schedule.

All of these factors considered, and taking into consideration the record of past events, the likelihood of a catastrophic dam failure or incident in Region 8 is unlikely, but still possible. This gives a probability rating for dam failure of **Unlikely**. A number of the dam failures in Wyoming and other Rocky Mountain states occurred because of snowmelt flooding that exceeded the capacity and strength of levees and dams. Wyoming's dams will continue to be tested by snowmelt, heavy rains, and other types of floods every year. The entire Region remains at risk to dam failures from the high and low hazard dams located throughout the county. In addition, the other low hazard dams could potentially fail more frequently and but cause fewer issues downstream.

Climate Change Impacts

As dam infrastructure ages, its performance and reliability may decline, posing risks to safety, functionality, and efficiency. Infrastructure materials, such as concrete, steel, and asphalt, can deteriorate over time due to exposure to environmental factors such as moisture, temperature variations, chemicals, and UV radiation. This degradation can lead to cracks, rust, and weakening of structural elements, thus increasing the risk of dam failure.

As temperatures rise and precipitation patterns skew toward extreme ends of the spectrum (both drought and deluge), the impacts to aging infrastructure may be accelerated. Intense extreme rainfall events can lead to greater inflows of water into reservoirs, which may exceed a dam's capacity, potentially leading to dam overtopping and failure. On the other end of the spectrum, prolonged droughts can result in lower levels of water in reservoirs, exposing more infrastructure to aging elements, and increasing susceptibility to structural issues. These same issues- Intense rainfall and flooding, temperature change, frequent storms and cumulative damage by repeated events can plague levees as well. Proactive monitoring and maintenance will be needed to ensure the safety of dams and levees in Teton County.

Vulnerability Assessment

Both Jackson Lake Dam and Grassy Lake Dam are considered high-hazard dams; that is, these two dams could result in significant damage and loss of life downstream if they were to fail, either naturally or due to mis-operation. While Grassy Lake Dam is in Teton County, WY, much of the risk associated with a failure of the Grassy Lake Dam exists in Idaho. As a result, no dam failure mapping was produced for a failure scenario of the Grassy Lake Dam. Due to homeland security concerns inundation mapping is not available for federal dams including the US Bureau of Reclamation owned Jackson Lake Dam. Hard copy maps are available to Teton County Emergency Management within the dams' Emergency Action Plan.

PEOPLE

Dam incidents can result in sudden and massive flooding, posing severe risk to human life. People living in dam inundation areas may have limited time to evacuate, leading to casualties and injuries. Those at greatest risk are those in affected areas who have access and functional needs, such as those with disabilities, injuries, limited access to transportation or financial resources, the elderly, and people experiencing homelessness.

According to the National Levee Database, approximately 3,117 people live behind levees in Teton County, the majority of which are along the Snake and Gros Ventre Rivers. This value is similar to the 3,786 people estimated to live behind levees in Teton County by an analysis

presented in the flood section of this HMP (see Section 4.2.5, especially Table 4-25 and surrounding text). These residents are also vulnerable to the impacts of flooding in the event of a levee failure or overtopping, which also may occur as a compounding impact of a dam incident.

BUILT ENVIRONMENT

The sudden release of water from a failed dam can cause widespread property damage. Homes, buildings, and infrastructure in the floodplain can be severely damaged or destroyed, as these properties would experience the largest, most destructive surge of water. Low-lying areas are also vulnerable as dam waters settle and collect.

Similar to the flood vulnerability analysis conducted for the plan update and described in Section 4.2.5, a vulnerability analysis was done for people and property located in "Areas Protected by Levee" designated by FEMA for Teton County. The levee system along the Snake River in unincorporated Teton County is protecting a great deal of property value from the impacts of flooding, with an estimated total property value of approximately $7.7 billion protected. This is vulnerable to loss or damage in the event of a partial or complete failure of this levee system. Figure 4-7 shows the areas protected by the northern half of the levee system and Table 4-12 provides an analysis of asset value at risk to failure of the entire levee system.

Figure 4-7 Teton County Areas Protected by levee

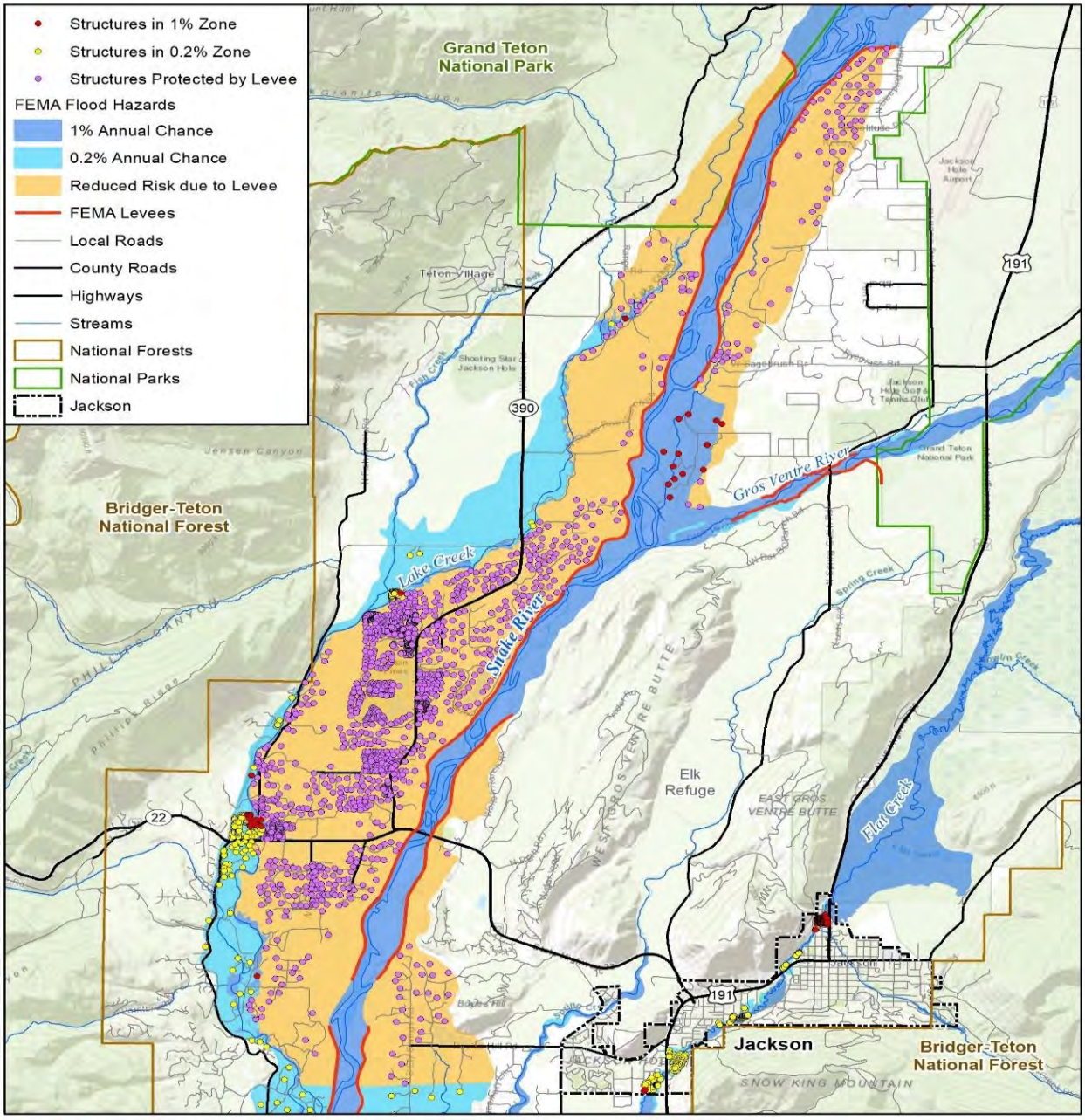


Table 4-12 Teton County Parcels at Risk to FEMA Area Protected by Levee Flood Hazard

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE	ESTIMATED LOSSES
Unincorporated	Agricultural	14	14	$30,734,697	$30,734,697	$61,469,394	$15,367,349
	Com. Vacant Land	2	4	$368,384	$368,384	$736,768	$184,192
	Commercial	52	59	$115,245,119	$115,245,119	$230,490,238	$57,622,560
	Multi-Use	2	2	$4,995,641	$4,995,641	$9,991,282	$2,497,821
	Res. Vacant Land	2	2	$484,230	$242,115	$726,345	$181,586
	Residential	1,591	1,621	$4,915,740,370	$2,457,870,185	$7,373,610,555	$1,843,402,639
	Total	**1,663**	**1,702**	**$5,067,568,441**	**$2,609,456,141**	**$7,677,024,582**	**$1,919,256,146**

Source: Teton County, Wyoming CAMA 2024, FEMA NFHL Effective Date 9/16/2015, WSP GIS Analysis

ECONOMY

Dam incidents could cause significant economic disruptions in the affected region. Businesses may suffer damage or destruction, leading to income losses and reduced economic activity. Long-term loss of water in a reservoir, which may be critical for potable water needs, can interrupt the water supply, affecting drinking water availability, agricultural needs, and industrial water usage.

CRITICAL FACILITIES AND LIFELINES

Roads, bridges, utility lines, and other critical infrastructure exists in the likely path of dam inundation and could be damaged or destroyed. Loss of this infrastructure may disrupt transportation, communication, and access to essential services. Loss of these facilities could create additional isolation issues for the inundation areas.

The analysis presented in Table 4-13 is based on the 500-year floodplain inundation area for the Jackson Lake Dam described in the vulnerability assessment. In the event of a catastrophic failure of Jackson Lake Dam the floodwater flow could be up to 30 times greater.

Dams are critical facilities themselves and can be affected by other hazards, notably flooding, earthquakes, and landslides. The High Hazard dams have emergency spillways designed to alleviate excess flow and prevent overtopping.

Table 4-13 Critical Facilities at Risk to Area Protected by Levee Flood Hazard by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	-	-	-	-	-	-	**0**
Unincorporated	1	2	-	2	2	8	1	2	1	**19**
Total	**1**	**2**	**0**	**2**	**2**	**8**	**1**	**2**	**1**	**19**

Source: Teton County, FEMA NFHL & HAZUS-MH MR2, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

Reservoirs held behind dams affect many ecological aspects of a river. River topography and dynamics depend on a wide range of flows, but rivers below dams often experience long periods of very stable flow conditions or saw-tooth flow (when water volumes rapidly oscillate between higher and lower flow volumes) patterns caused by intermittent releases. Water releases from dams usually contain very little suspended sediment, which can lead to scouring of riverbeds and banks.

The environment would be vulnerable to a number of risks in the event of dam failure. The inundation could introduce many foreign elements into local waterways, potentially causing the destruction of downstream habitats.

Land Use and Development Trends

Continued maintenance and operation of the Jackson Lake Dam by the US Bureau of Reclamation is necessary to ensure sunny day failures are avoided. Increases in property values and additional development in the desirable Snake River corridor may increase the overall potential for losses, including loss of life.

No specific new growth or development within the County, Town of Jackson, or the Teton Conservation District in the past five years has significantly altered the general risk to impacts of dam failure. While current land use practices do not specifically account for rare but catastrophic events like that associated with failure of the Jackson Lake Dam, however the Town of Jackson is not within the inundation zone of any high hazard dams. Teton Conservation District has minimal physical assets, none of which are exposed to dam inundation.

Risk Summary

In 2004, the U.S. Department of the Interior- Bureau of Reclamation released Technical Memorandum No. JL-8313-4, which reported findings from a seismic risk analysis of the Jackson Lake Dam and Jackson Lake. The findings concluded that the total seismic hazard at Jackson Lake Dam is generally dominated by ground motions produced by the Teton Fault, and that the earthen embankment portion of the dam is at higher risk due to susceptibility to long-period ground motion. Risk Score is summarized for the Dam Failure Hazard below. While dam failures are somewhat rare events, they can have catastrophic consequences and associated damages and have the potential to impact large areas given the large quantities of water being impounded.

Table 4-14 RISK SUMMARY BY JURISDICTION: Dam /Levee Incident

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	Medium	Development in Snake River corridor in risk areas; some county roads affected including state highway bridges.
Town of Jackson	NA	No dams or levees upstream
Teton Conservation District	Low	Not considered to have significant impacts to District facilities.
Flat Creek Watershed Association	NA	No dams or levees upstream
Jackson Hole Airport	NA	Not in dam or levee inundation area.

4.2.3 Drought

Description

Drought is described as a protracted period of deficient precipitation resulting in extensive damage to vegetation. Of all the natural weather-related disasters, drought is by far the costliest to our society. It indirectly kills more people, animals, and plants than the combined effects of hurricanes, floods, tornadoes, blizzards, and wildfires. And, unlike other disasters that quickly come and go, drought's long-term, unrelenting destruction has been responsible in the past for mass migrations and lost civilizations. The 1980 and 1988 droughts in the U.S. resulted in approximately 17,500 heat-related deaths and an economic cost of over $100 billion. Drought occurs in four stages and is defined as a function of its magnitude (dryness), duration, and regional coverage. Severity, the most commonly used term for measuring drought, is a combination of magnitude and duration.

The first stage of drought is known as a meteorological drought. The conditions at this stage include any precipitation shortfall of 75% of normal for three months or longer. The second stage is known as agricultural drought. Soil moisture is deficient to the point where plants are

stressed, and biomass (yield) is reduced. The third stage is the hydrological drought. Reduced stream flow (inflow) to reservoirs and lakes is the most obvious sign that a serious drought is in progress. The fourth stage is the socioeconomic drought. This final stage refers to the situation that occurs when physical water shortage begins to affect people.

As these stages evolve over time, the impacts to the economy, society, and environment can converge into an emergency situation. Without reservoir water to irrigate farms, food supplies are in jeopardy. Without spring rains for the prairie grasslands, open range grazing is compromised. Without groundwater for municipalities, the hardships to communities can result in increases in mental and physical stress as well as conflicts over the use of whatever limited water is available. Without water, wetlands disappear. Other animal and plant species also suffer from lack of (or degraded) proper food, nutrients, water, and habitat. The quality of any remaining water decreases due to its higher salinity concentration. There is also an increased risk of fires, and air quality degrades as a result of increased soil erosion particles in strong winds (blowing dust).

Location

In Wyoming and throughout the Columbia River Basin, specifically the Snake River, along with the Missouri River Basin, drought is a recurring climatic phenomenon. According to the NOAA NIDIS, moderate to severe droughts have become commonplace in much of the state since 1999, owing to its natural climate. Among these, the multi-year drought spanning from 1999 to 2009 stands out as one of the most severe in living memory. However, the region has a history of enduring prolonged drought events, with notable occurrences in the 1930s and 1950s that significantly impacted water supplies, agriculture, energy, transportation, and ecosystems (https://www.drought.gov/states/Wyoming).

More recently, lower summer snowmelt runoff, warming temperatures, and reduced precipitation have all been reported by the US. Department of Interior as contributing to a drought within the Columbia River Basin. NOAA's National Integrated Drought Information System (NIDIS) has 21,294 people within the county as affected by drought in 2024, with Teton National Forest having the most intense drought and being listed as "Extreme Drought".

The Missouri River Basin experienced short-duration droughts that brought disruption. The intense summertime drought of 2012 caught the region off guard, especially following the devastating floods of 2011, which had led many to anticipate continued flooding. Responding to these challenges, NOAA's National Integrated Drought Information System (NIDIS) initiated the Missouri River Basin Drought Early Warning System (DEWS) in 2014. This system serves as a collaborative network of regional and national partners, aimed at sharing information and coordinating actions to aid communities in mitigating the impacts of drought. Wyoming is also affiliated with the Intermountain West DEWS.

The years 2020-2021 witnessed another significant drought event in the same area, amounting to billions of dollars in damages and reverberating impacts on communities, ecosystems, water resources, and agricultural systems across the region. According to USDAAs of April 4, 2023, drought conditions have improved across much of the western United States compared to 2021 and 2022, including Wyoming.

Extent (Magnitude)

The U.S. Drought Monitor is an accepted and widely used site for obtaining and summarizing drought information, as it integrates data from several other sources including the Palmer Drought Index, Soil Moisture Models, U.S. Geological Survey Weekly Stream Flows, Standardized Precipitation Index, and the Satellite Vegetation Health Index. It includes drought intensity categories for measuring dry conditions across counties, states, and regions

of the U.S., so that drought can be quantified. These categories range from “abnormally dry” to “exceptional drought.” Table 5 below shows the different classifications.

Table 4-15 US Drought Monitor Classifications

NDMC* Drought Category	Return Period (Years)	Description of Possible Impacts
D0	3 to 4	**Going into drought:** • Short-term dryness. • Slowing growth of crops or pastures. • Fire risk above average. **Coming out of drought:** • Some lingering water deficits. • Pastures or crops not fully recovered.
D1	5 to 9	Some damage to crops or pastures, fire risk high, streams, reservoirs, or wells low, some water shortages (developing or imminent), voluntary water use restrictions requested.
D2	10 to 17	Crop or pasture losses likely, fire risk very high, water shortages common, water restrictions imposed.
D3	18 to 43	Major crop and pasture losses, extreme fire danger, widespread water shortages or restrictions.
D4	43+	Exceptional and widespread crop and pasture losses, exceptional fire risk, shortages of water in reservoirs, streams, and wells creating water emergencies.

*Source: National Drought Mitigation Center

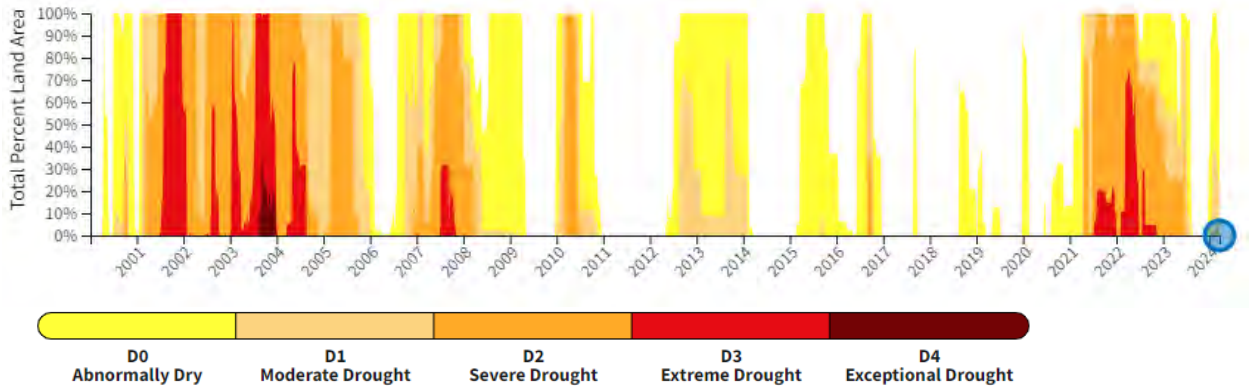
According to U.S. Drought Monitor records, in the 1199-week period from January 1, 2000, through December 31, 2023, the Teton County spent 921 weeks (76.81% of the time) in some level of drought, defined as D0 or worse conditions. Weeks in drought are summarized in Table 4-16 and shown in time series in Figure 4-8.

Table 4-16 Teton County Weeks in Drought by Intensity, 2000 - 2023

CATEGORY	DROUGHT SEVERITY	PALMER DROUGHT INDEX	STANDARDIZED PRECIPITATION INDEX (SPI)	TETON COUNTY WEEKS IN DROUGHT, 2001 - 2024
D0	Minor	-1.0 to -1.9	-0.5 to -0.7	921
D1	Moderate	-2.0 to -2.9	-0.8 to -1.2	661
D2	Severe	-3.0 to -3.9	-1.3 to -1.5	439
D3	Extreme	-4.0 to -4.9	-1.6 to -1.9	208
D4	Exceptional	-5.0 or less	Less than -2	20

Source: U.S. Drought Monitor

Figure 4-8 Teton County Drought History and Intensity, 2000 - 2023



Source: U.S. Drought Monitor

Drought impacts can be wide-reaching: economic, environmental, and societal. The most significant impacts are to water-intensive activities such as agriculture, wildfire protection, municipal usage, commerce, and tourism and recreation. Water quality deterioration can also occur during a drought. A reduction of electric power generation is also a potential problem. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. Drought impacts increase with the duration of a drought as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. In the future, climate change is likely to increase the magnitude and severity droughts in Teton County.

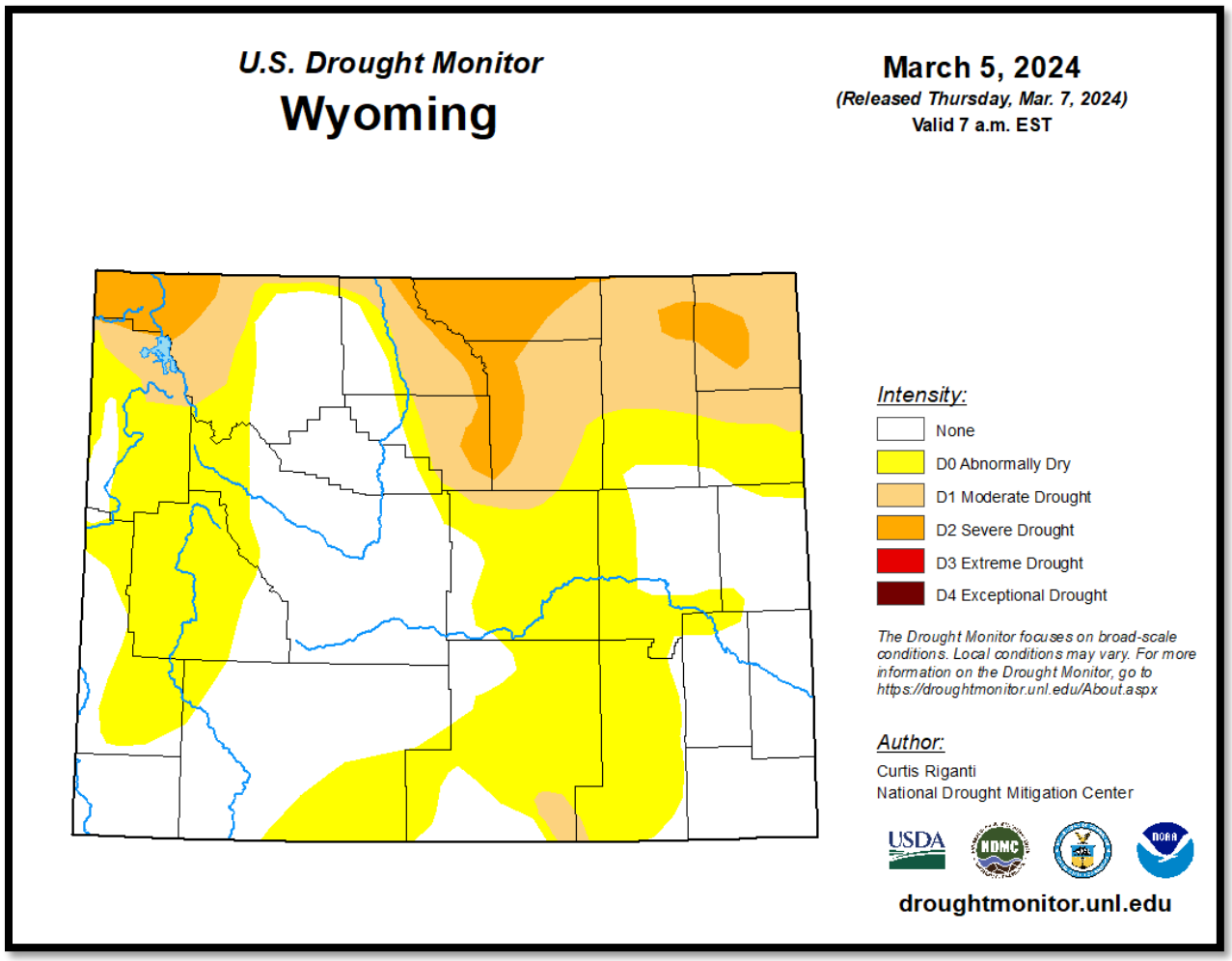
Previous Occurrences

The worst drought period in Teton County and the Town of Jackson over the last 20 years was in late 2003, occurring in the middle of the 1999-2009 statewide drought. A look at the climate record from September 30, 2003, shows that the entire county was in Extreme Drought (Category D3) with northwest portions of the county west of the Tetons and north into western Yellowstone in Exceptional Drought (Category D4).

During the summers of 2021, 2022, and 2023, Teton County was again designated as a disaster area from severe drought. By early April 2021, 100% of Teton County, Wyoming was classified as being in drought, and in mid- July, all portions of Teton County were upgraded to Severe Drought. Teton Conservation District noted 30-year low stream flows in a few tributaries, including the Buffalo Fork, the Gros Ventre, Pacific Creek, Cache Creek, and others. Jackson Hole Airport was also experiencing below average stream flows and the lowest ground water levels that have been observed in the twelve-year period of record from 2010 to 2020 (https://www.tetonconservation.org/blog/2022/7/29/how-do-we-know-were-in-a-drought).

In 2019, Wyoming experienced its 45th warmest July of the last 125 years. Only Climate Divisions (CD) 5 and 6, in the northeast, had rankings that were in the cooler half of years. These two divisions saw their 55th and 43rd coolest Julys, respectively. CD 10 had the lowest warm ranking finishing the month as the 29th warmest July since 1895.

Figure 4-9 Drought Conditions- March 7, 2024



Probability of Future Events

Based on the record of previous occurrences, droughts tend to occur at least every 10 years and sometimes last for multiple years, giving the planning area a likely probability of future occurrence. Droughts are often regional events, impacting multiple counties and states simultaneously. According to the Wyoming State Climate Office, Wyoming is the 5th driest state in the US and drought is expected to be a normal occurrence due to the State's natural climate. According to the 2015 States at Risk Report Card by Climate Central, Wyoming faces an average drought threat compared to other states across the US and summer droughts are predicted to get worse by 2050. Climate Central also reports that summer precipitation in Teton County has decreased since 1970 and is predicted to continue to trend in that direction.

Climate Change Impacts

Based on findings from the 2023 Fifth National Climate Assessment, the Northern Great Plains region is expected to experience a notable rise in drought occurrences. Projections suggest localized droughts will intensify by 2040, followed by a broader regional increase by 2070. Various climate scenarios indicate a concerning trend of more frequent moderate, severe, and extreme droughts, with anticipated occurrences rising by approximately 10% and 20% by 2050 and 2100, respectively. Notably, droughts experienced in the upper Missouri River basin

(which a small portion of northern Teton County extends into) from 2000 to 2010 marked the most severe in recorded history, underscoring the urgency of addressing this issue. Additionally, the emergence of flash droughts poses a growing concern, warranting proactive measures to mitigate their impacts. According to the National Oceanic and Atmospheric Administration (NOAA), flash droughts are the rapid onset of drought conditions set in motion by lower-than-normal rates of precipitation, accompanied by abnormally high temperatures, winds, and radiation. Seasonal precipitation patterns are projected to shift, leading to dryer summers and less precipitation as snow in early spring and late fall seasons. This, coupled with earlier spring runoff, is projected to result in longer duration in droughts statewide.

Vulnerability

Drought can have broad-reaching impacts throughout the County and Town of Jackson, ranging from water users (recreational, agricultural, etc.) to economic, social, and commercial impacts.

PEOPLE

During times of prolonged drought, water scarcity can cause an increase in food prices and a decrease in water quality. Food shortages and water scarcity can lead to malnutrition and related health problems. Additionally, drought conditions can create an environment conducive to the spread of disease due to decreased water quality and inadequate access to clean water. Indirectly, drought can lead to respiratory issues as dust increases due to dry soil and reduced vegetation cover. Drought can also prime environments for wildfire, which can in turn increase respiratory issues through the inhalation of smoke and other volatile organic compounds (VOCs). These issues resulting from drought can cause the displacement of individuals, families, or whole communities, leading to humanitarian issues and increased challenges for host communities.

BUILT ENVIRONMENT

Typically, structures are not directly vulnerable to drought, although secondary, indirect, and compound impacts may increase vulnerability. Reduced soil moisture can lead to subsidence, which can cause structural damage to buildings and roadways. Impacts may include cracked foundations and walls and sinking roads and potholes. The rehydrating of soils can further compound these issues.

ECONOMY

Economically, the recreation/tourism and agricultural sectors are the most vulnerable to drought and will benefit the most from mitigation efforts. According to data from NOAA, as of March 2024, the areas affected by drought have led to an estimated 10,818 acres of hay being impacted, alongside 2,483 cattle and 163 sheep.

The types of crops grown in the Snake/Salt River basin are greatly influenced by climate. Typical farmland in the basin is in the high mountain valleys where there is low to moderate precipitation. These valleys have relatively short growing seasons and long winters with significant accumulations of snow. Hard frosts have been observed in every month of the year. Because of these conditions typical crops consist of alfalfa, small grains (mainly barley with some oats), and native hay and grass.

Table 4-17 Teton County/Town of Jackson Agricultural Overview

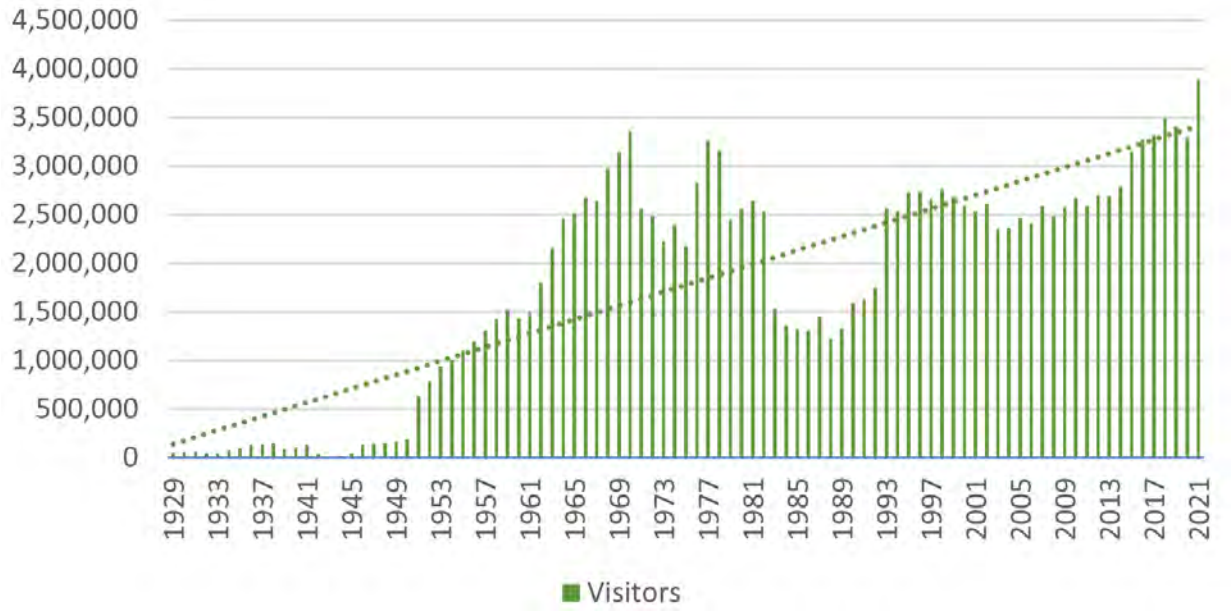
	2022 CENSUS OF AGRICULTURE	CHANGE SINCE 2017
Number of Farms	111	-22%
Land in Farms	38,130 acres	-44%
Average Size of Farm	344 acres	-28%

	2022 CENSUS OF AGRICULTURE	CHANGE SINCE 2017
Market Value of Products Sold by Farm	$98,047	-21
Farm-Related Income by Farm	$128,720	6%
Total Farm Production Expenses by Farm	$117,048	-31%
Net Cash Farm Income by Farm	12,579	96%

Source: USDA, Census of Agriculture 2023

Outdoor recreation and tourism, which are important to the region's economy, are also vulnerable to drought. Recreation is generally considered a non-consumptive use of water; there is, however, a significant amount of recreational activity within Teton County, and this is a driving force behind the tourism industry that impacts both the County and the Town of Jackson. People travel from around the world in order to boat, fish, ski, camp, and hike in this part of Wyoming. Tourism has a major impact on the economies of the communities in the basin, with much of the tourism being linked to Grand Teton and Yellowstone National Parks. Many of the draws of these parks are water related, with the most notable water features within the basin being Jackson Lake and the Snake River. Thousands visit the river each year for rafting, kayaking, fishing, and other activities. In addition to the Snake River and Jackson Lake, there are numerous rivers, streams, and lakes throughout the basin that are used for recreation as well as agriculture. A drought in certain areas that rely heavily on the Columbia Basin for agricultural production can cause the draining of other local sources, such as Jackson Lake. Other activities that utilize or require water in some form include waterfowl hunting and winter sports such as skiing.

Figure 4-10 Grand Teton Annual Visitation 1929 - 2021



Source: National Park Service, 2022

CRITICAL FACILITIES AND LIFELINES

Drought can stress water supply systems, including reservoirs, water treatment plants, and pipes. In addition to reduced water availability for domestic, industrial, and agricultural uses, reduced water levels can lead to the accumulation of sediments and debris, impacting the functionality of pipes and other water infrastructure.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

Reduced water availability can impact plant growth and the survival rate of various animal species. Over time, this can lead to habitat degradation and fragmentation, which in turn, can result in a decline in biodiversity and the loss of plant and animal species. One specific example of this is the increased stress of drought periods cause on conifer species weakens their ability to defend themselves against infestations of pine bark beetles. This further leads to widespread die offs in conifer stands, which leads to ecological disruptions, increased wildfire risk, and associated economic impacts. Drought also can impact fish populations particularly on the smaller streams in the region.

Impacts such as these can further impair cultural practices that are dependent on native habitats.

Land Use and Development Trends

No specific new growth or development within the County, Town of Jackson, or the Teton Conservation District in the past five years has significantly altered the regions vulnerability to drought. The 2012 Jackson Teton County Comprehensive Plan was reevaluated in 2016 upon hitting the 5% growth trigger. This led to the adoption of an updated plan in November 2020, which prioritizes steering growth towards regions equipped with existing infrastructure and services to foster 'Complete Neighborhoods.' With freshwater resources dwindling and the energy demand for potable water escalating, the revised plan underscores the importance of water conservation. The intent is to not only preserve water to safeguard aquifer reservoirs for future generations but also preserves ecosystems and honors downstream users. To incentivize water conservation, the plan advocates for municipal pricing structures that accurately reflect the true long-term production costs while promoting water-saving behaviors. Additionally, the plan advocates for practices that reduce water consumption, such as utilizing native species for landscaping. Local programs and initiatives have been established that aim to protect water resources and water quality, like the Jackson Hole Clean Water Coalition's Trout-Friendly Lawns program. This program, among other strategies, includes a homeowner certification whereby property owners pledge to follow recommended best practices for water conservation and beneficial water quality techniques to protect the planning area's water resources. Due to these initiatives' drought vulnerability has not increased due to growth and development since the last plan update.

Risk Summary

Table 4-18 Risk Summary by Jurisdiction: Drought

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	Medium	Impacts to local economy including recreation and tourism, ranching and agriculture
Town of Jackson	Medium	Impacts to local economy including recreation and tourism
Teton Conservation District	Medium	Loss of forage yield for wildlife and domestic animals. Decreased fuel moisture leading to vulnerable wildfire conditions. Reduced inflow to reservoirs and less water in hydrologic storage systems means less irrigation, recreation, wildlife habitat, hydropower. Ecosystem stress.
Flat Creek Watershed Association	Medium	Potential to affect stream flows, water quality, and fish habitat within the district boundaries.

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
Jackson Hole Airport	Medium	Impacts to local economy including recreation and tourism causing decrease in visitation.

4.2.4 Earthquake

Description

An earthquake is generally defined as a sudden motion or trembling in the earth caused by the abrupt release of strain accumulated within or along the edge of the earth's tectonic plates. The most common types of earthquakes are caused by movements along faults or by volcanic forces, although they can also result from explosions, cavern collapse, and other minor causes not related to slowly accumulated strains. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and snap to a new position. In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake at varying speeds.

Earthquakes can last from a few seconds to over five minutes; they may also occur as a series of tremors over several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage, or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer, and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides, or releases of hazardous material, compounding their disastrous effects.

Earthquakes tend to reoccur along faults, which are zones of weakness in the crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur. Small, local faults produce lower magnitude quakes, but ground shaking can be strong, and damage can be significant in areas close to the fault. In contrast, large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area.

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, communication, and transportation lines. Other damaging effects of earthquakes include surface rupture, fissuring, ground settlement, and permanent horizontal and vertical shifting of the ground. Secondary impacts can include landslides, seiches, liquefaction, fires, and dam failure. The combination of widespread primary and secondary effects from large earthquakes makes this hazard potentially devastating.

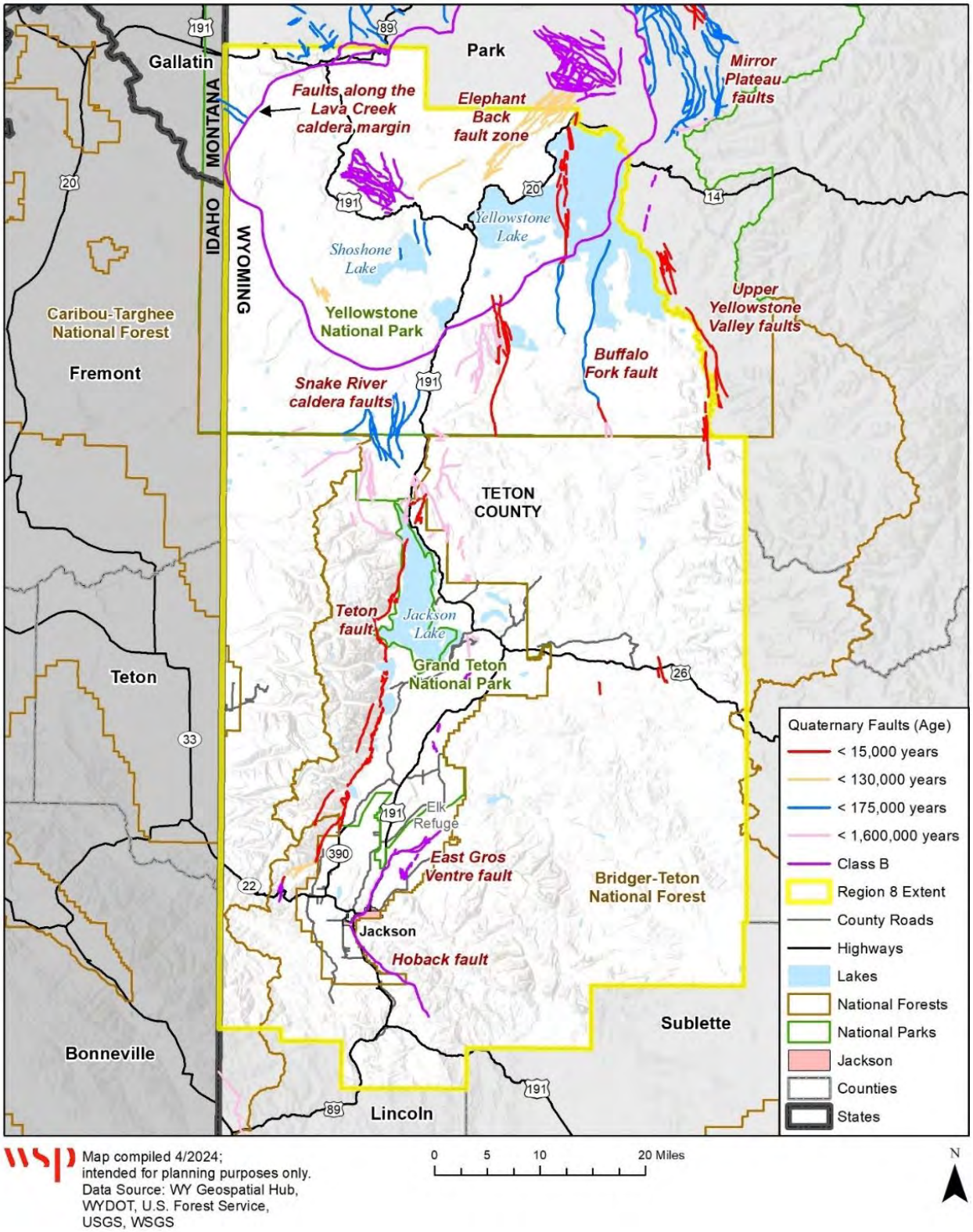
Part of what makes earthquakes so destructive is that they generally occur without warning. The main shock of an earthquake can usually be measured in seconds, and rarely lasts for more than a minute. Aftershocks can occur within the days, weeks, and even months following a major earthquake.

Location

Teton County is located in an area of significant seismic activity within Wyoming, nestled along and in proximity to major, active fault lines. The two main faults in the County are the Hoback Fault and the Teton Fault. Although large earthquakes in Teton County are less frequent compared to other areas, they can occur due to the geological complexities of the region. The state's most powerful earthquake was recorded nearby Yellowstone National Park, on August

18, 1959. This event registered a magnitude of 6.5 and was classified as an aftershock of the Hebgen Lake, Montana Earthquake.

Figure 4-11 Quaternary Faults in Teton County



Extent (Magnitude)

Frequently, the most conspicuous aftermath of an earthquake arises from the vertical and/or horizontal shifting of the ground along fault lines. This displacement has the potential to sever transportation, energy, utility, and communication networks, potentially affecting numerous systems and individuals. Moreover, structures situated directly above fault lines may sustain severe and complete damage due to these ground movements. However, the primary cause of damage during earthquake events is typically the shaking itself. This shaking can give rise to several additional phenomena including:

- Further ground displacement
- Landslides and avalanches
- Liquefaction and subsidence
- Seismic seiches

The energy released during an earthquake is commonly quantified using Ritcher Magnitude, measured directly from seismic recording. Seismologists utilize the moment magnitude scale (MMS or denoted as MW or M) to gauge earthquake size based on energy release. Developed in the 1970s as an advancement over the Ritcher scale, the moment magnitude scale maintains a similar range of magnitude values while employing distinct formulas. Intensity, another measure of earthquake severity, reflects the degree of ground shaking felt by humans or the resulting structural damage, as indicated on the Modified Mercalli scale. Seismic shaking typically inflicts the most damage to structures during earthquakes. Seismic seiches occur in standing bodies of water and can occur due to earthquakes. Seiches are standing waves that oscillate at the surface of the water. Larger ones can be very destructive and cause flooding.

Table 4-19 Modified Mercalli Intensity (MMI) Scale

MMI	FELT INTENSITY	ACCELERATION (%G) (PGA)
I	Not felt except by a very few people under special conditions. Detected mostly by instruments.	<0.17
II	Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.	0.17 – 1.4
III	Felt noticeably indoors. Standing automobiles may rock slightly.	0.17 – 1.4
IV	Felt by many people indoors, by a few outdoors. At night, some people are awakened. Dishes, windows, and doors rattle.	1.4 – 3.9
V	Felt by nearly everyone. Many people are awakened. Some dishes and windows are broken. Unstable objects are overturned.	3.9 – 9.2
VI	Felt by everyone. Many people become frightened and run outdoors. Some heavy furniture is moved. Some plaster falls.	9.2 – 18
VII	Most people are alarmed and run outside. Damage is negligible in buildings of good construction, considerable in buildings of poor construction.	18 – 34
VIII	Damage is slight in specially designed structures, considerable in ordinary buildings, great in poorly built structures. Heavy furniture is overturned.	34 – 65
IX	Damage is considerable in specially designed buildings. Buildings shift from their foundations and partly collapse. Underground pipes are broken.	65 – 124
X	Some well-built wooden structures are destroyed. Most masonry structures are destroyed. The ground is badly cracked. Considerable landslides occur on steep slopes.	>124
XI	Few, if any, masonry structures remain standing. Rails are bent. Broad fissures appear in the ground.	>124

MMI	FELT INTENSITY	ACCELERATION (%G) (PGA)
XII	Virtually total destruction. Waves are seen on the ground surface. Objects are thrown in the air.	>124

Source: USGS. http://earthquake.usgs.gov/learn/topics/mercalli.php, Modified Mercalli Intensity and peak ground acceleration (PGA) (Wald, et al 1999).

Previous Occurrences

Earthquakes are common across the state of Wyoming. Teton County and the Town of Jackson are located in a region known for significant earthquake activity in Wyoming, situated along and near major, active fault systems. The largest earthquake in the state occurred nearby, in Yellowstone National Park, on August 18, 1959. The earthquake was a magnitude of 7.3 and hit approximately 10.4 km away from West Yellowstone, Montana. The earthquakes greater than magnitude 4.1 are listed in Table 4-20 below.

Table 4-20 Earthquakes with a Magnitude greater than 4.1, 1959-2024

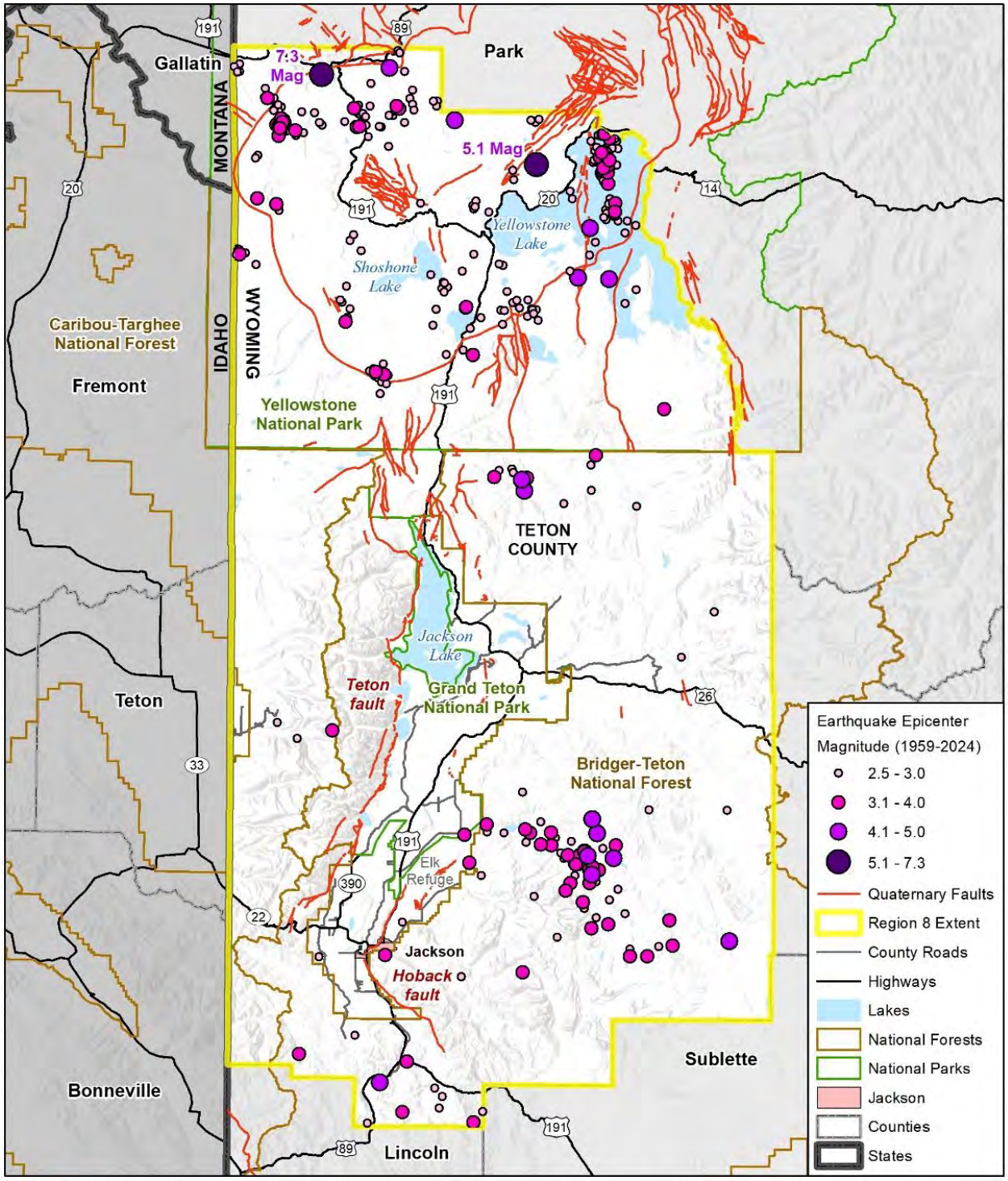
DATE	MAGNITUDE	APPROXIMATE LOCATION
8/18/1959	7.3	The 1959 Hebgen Lake, Wyoming
3/31/1973	5.1	51 km ESE of West Yellowstone, Wyoming
1/7/2004	5	20 km ESE of Kelly, Wyoming
3/28/1973	5	62 km ESE of West Yellowstone, Wyoming
8/27/2016	4.8	4 km ENE of Bondurant, Wyoming
8/5/2010	4.8	19 km E of Kelly, Wyoming
8/21/1985	4.8	12 km S of Hoback, Wyoming
12/28/1993	4.7	38 km NE of Bondurant, Wyoming
2/6/1983	4.7	37 km ESE of West Yellowstone, Wyoming
9/7/1985	4.6	14 km SSE of Hoback, Wyoming
3/30/1973	4.6	68 km ESE of West Yellowstone, Wyoming
12/28/2008	4.6	58 km SSE of Mammoth, Wyoming
12/20/1983	4.5	1 km NE of Hoback, Wyoming
3/28/1973	4.5	64 km ESE of West Yellowstone, Wyoming
8/30/1974	4.5	27 km E of West Yellowstone, Wyoming
8/21/2003	4.5	53 km N of Kelly, Wyoming
10/24/2010	4.4	20 km E of Kelly, Wyoming
6/20/1998	4.4	8 km E of Hoback, Wyoming
9/27/2001	4.3	35 km WSW of Dubois, Wyoming
8/21/2003	4.3	53 km N of Kelly, Wyoming
8/5/2010	4.2	19 km E of Kelly, Wyoming
10/22/2002	4.2	10 km SSW of Hoback, Wyoming
8/30/1985	4.2	10 km ESE of Alpine Northeast, Wyoming
8/17/2010	4.1	22 km E of Kelly, Wyoming

Source: USGS

There are approximately 80 Quaternary faults throughout the State of Wyoming. Two main fault systems outside of Yellowstone National Park lie within Teton County and could impact the Town of Jackson: The Teton Fault and Hoback Fault.

Fault systems to the North and South also have the potential to impact the county. Proximity to the Yellowstone Hotspot and active tectonics create conditions that increase the occurrence and presence of fractures and faults in Teton County and northwestern Wyoming in general. Figure 4-12 presents the location of Quaternary Faults in the planning area, as well as historic epicenter locations.

Figure 4-12 Faults and Epicenters



Map compiled 4/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, U.S. Forest Service, HIFLD,
USGS, WSGS

Probability of Future Events

The U.S. Geological Survey (USGS) releases probabilistic acceleration maps for different time frames, including 5000-, 1000-, and 2,500-year intervals. These maps indicate the likelihood of certain acceleration levels being reached or surpassed within those times frames by expressing the probability of such occurrences within shorter intervals. For instance, a 10% probability of acceleration being reached or exceeded in 50 years is roughly equivalent to a 100% probability of exceeding it within 500 years.

Historically, the USGS has produced probabilistic acceleration maps for Wyoming. Previously, the 500-year map was commonly used for planning purposes for typical structures and served as the foundation for the prevailing Uniform Building Code. However, the updated International Buildings Code now utilizes a 2,500-year map as the reference for building design. These maps reflect the current understanding of seismic activity in Wyoming.

In many regions of Wyoming, ground accelerations depicted on the USGS maps may be augmented due to local soil conditions. For example, if soft, saturated sediments may exist at the surface and seismic waves pass through them, surface ground accelerations typically exceed those experiences if only bedrock were present. Consequently, the ground accelerations indicated on the USGS maps may underestimate the local hazard, as they are based on expectations for firm soil or rock at the surface.

Teton County is situated in a seismically active region, with known fault lines such as the Teton Fault posing potential earthquake risks. The probability of future earthquakes in the county is influenced by factors such as the tectonic settings, historical seismicity, and ongoing geological processes. Ongoing research and monitoring efforts help improve our understanding of seismic hazards and inform emergency preparedness and building code regulations to enhance resilience to earthquake events.

Climate Change Impacts

The impacts of global climate change on earthquake intensity and probability are largely unknown, but there is not expected to be a direct correlation.

Vulnerability Assessment

Numerous factors contribute to determining areas of vulnerability such as historical earthquake occurrence, proximity to faults, soil characteristics, building construction, and population density. Wyoming Geologic Survey noted that earthquakes below a 2.5 magnitude are not typically felt by people on ground surface. Although, damages occur at magnitudes greater than 5.0.

PEOPLE

The entire population within the region faces potential exposure to both direct and indirect impact from earthquakes. The extent of this exposure hinges on various factors, such as the age and construction materials of buildings, underlying soil types, proximity to fault lines and earthquakes epicenter, and more. Whether affected directly or indirectly, the entire population will inevitably contend with the aftermath of an earthquake to varying degrees. Business disruptions may hinder employment opportunities, road closures could isolate communities, and utility service disruptions form the from the earthquake itself.

Three population groups are particularly vulnerable to earthquake hazards:

- **Linguistically Isolated Populations**—Problems arise when there is an urgent need to inform non-English speaking residents of an earthquake event. They are vulnerable because of difficulties in understanding hazard-related information from predominantly English-speaking media and government agencies.

- **Population below Poverty Level**—Families and individuals with incomes below the poverty level may lack the financial resources to improve their homes to prevent or mitigate earthquake damage. Poorer residents are also less likely to have insurance to compensate for losses in earthquakes.
- **Population over 65 Years Old**—This population group is vulnerable because they are more likely to need special medical attention, which may not be available due to isolation caused by earthquakes. Elderly residents also have more difficulty leaving their homes during earthquake events and could be stranded in dangerous situations.

Casualty impacts on persons in the planning area were estimated for the 2,500-Year Probabilistic Earthquake. Casualty levels as defined by HAZUS-MH 6.1 are described as follows:

- Level 1: Injuries will require medical attention, but hospitalization is not needed.
- Level 2: Injuries will require hospitalization but are not considered life-threatening.
- Level 3: Injuries will require hospitalization and can become life-threatening if not promptly treated.
- Level 4: Victims are killed by the earthquake.

Figure 4-13 Estimated Earthquake Impacts on Persons and Household

SCENARIO	NUMBER OF DISPLACED HOUSEHOLDS	NUMBER OF PERSONS REQUIRING SHORT-TERM SHELTER
2,500-Year Earthquake	717	287

Source: HAZUS-MH 6.1 Global Summary Report, WSP Analysis

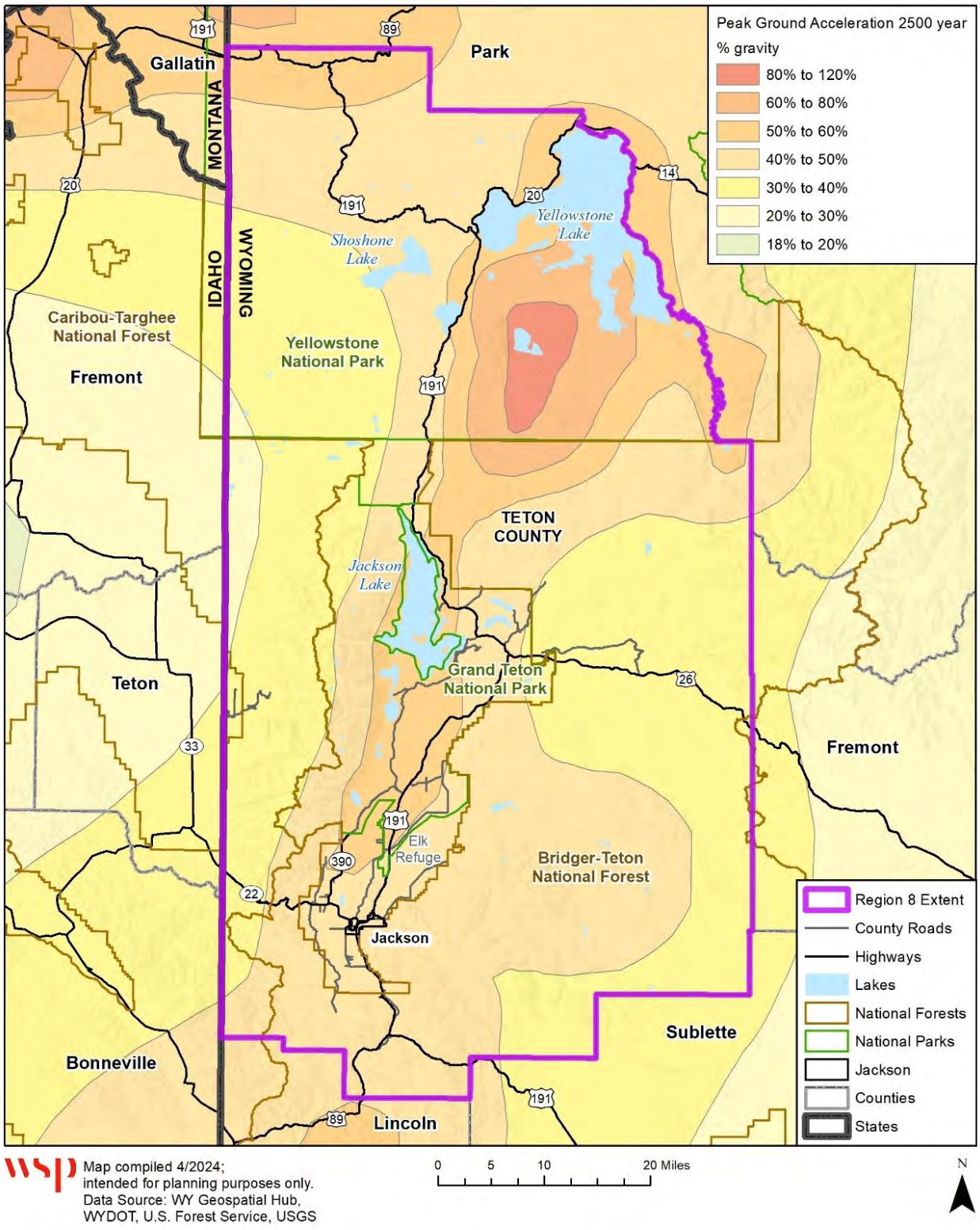
These impacts are summarized below. The casualty estimates are provided for three times of day: 2:00 AM, 2:00 PM, and 5:00 PM, The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considered that the educational, commercial, and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 4-21 Estimated 2500-Year Probabilistic Earthquake Impact on Persons and Households

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	1.69	0.41	0.06	0.12
	Commuting	0.01	0.01	0.02	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.94	0.22	0.03	0.06
	Other-Residential	26.80	6.28	0.79	1.55
	Single Family	68.69	16.05	2.07	4.04
	Total	**98**	**23**	**3**	**6**
2 PM	Commercial	104.16	25.33	3.63	7.08
	Commuting	0.08	0.11	0.18	0.03
	Educational	7.66	1.61	0.21	0.41
	Hotels	0.00	0.00	0.00	0.00
	Industrial	6.92	1.59	0.22	0.43
	Other-Residential	13.79	3.31	0.44	0.82
	Single Family	35.71	8.54	1.16	2.14
	Total	**168**	**40**	**6**	**11**
5 PM	Commercial	58.34	14.20	2.05	3.94
	Commuting	1.83	2.59	4.19	0.82
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.33	1.00	0.14	0.27
	Other-Residential	10.49	2.51	0.33	0.62
	Single Family	27.26	6.52	0.88	1.63
	Total	**102**	**27**	**8**	**7**

Source: HAZUS-MH 6.1 Global Summary Report, WSP Analysis

Figure 4-14 Teton County Peak Ground Acceleration



BUILT ENVIRONMENT

The built environment of Teton County remains highly vulnerable to the impacts of earthquakes, despite the area not experiencing seismic activity as frequently or as intensely as

other earthquake-prone regions. Even moderate earthquakes can result in substantial structural damage to buildings, bridges, roads, and other critical infrastructure. Depending on the earthquake's magnitude and proximity, the severity of damage can vary from minor cosmetic issues, such as cracks in walls and foundations, to the complete collapse of structures.

According to HAZUS simulation results, 9,768 buildings in the planning area—approximately 72.9% of the total building stock—are projected to experience some degree of damage during a significant earthquake event. This could range from minor repairs to moderate damage that requires temporary relocation of occupants, to major structural failures or even total destruction. The simulation further estimates that 365 buildings will be completely destroyed, posing a serious risk to residents, local businesses, and public safety.

Figure 4-15 Estimated Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	17.70	0.49	21.37	0.46	21.42	0.57	8.11	0.78	2.40	0.66
Commercial	334.32	9.23	412.12	8.90	455.79	12.23	192.10	18.38	55.66	15.24
Education	12.55	0.35	9.88	0.21	7.57	0.20	1.80	0.17	0.20	0.06
Government	12.09	0.33	15.12	0.33	16.23	0.44	6.52	0.62	1.04	0.28
Industrial	53.98	1.49	70.75	1.53	74.87	2.01	28.24	2.70	7.15	1.96
Other Residential	252.42	6.97	347.22	7.50	367.88	9.87	164.54	15.74	53.93	14.77
Religion	9.15	0.25	11.56	0.25	13.39	0.36	6.23	0.60	1.68	0.46
Single Family	2931.23	80.90	3744.32	80.83	2768.67	74.31	637.60	61.01	243.17	66.58
Total	**3,623**		**4,632**		**3,726**		**1,045**		**365**	

Source: HAZUS-MH 6.1 Global Summary Report, WSP Analysis

ECONOMY

Earthquakes can have both direct and indirect impacts on economy. Direct impacts manifest as physical damages and losses to buildings and infrastructure. Indirect effects are often felt through factors like lost wages decreased business income, relocation expenses, and other costs associated with recovery efforts. The table below represents data on capital stock and income losses in Region 8, illustrating the economic repercussions on seismic events.

Table 4-22 Region 8 economic impacts, 2,500-year probabilistic earthquake scenario

		CAPITAL STOCK LOSSES (THOUSANDS OF DOLLARS)					INCOME LOSSES (THOUSANDS OF DOLLARS)			
County	Structural	Non-Structural	Contents	Inventory	Loss Ratio (%)	Relocation	Capital-Related	Wages	Rental	Total Loss
Teton	**$161,066**	**$646,493**	**$228,162**	**$17,015**	**10.54%**	**$94,802**	**$71,366**	**$79,284**	**$57,700**	**$1,355,889**

Source: HAZUS-MH 6.1 Global Summary Report, WSP Analysis

CRITICAL FACILITIES AND LIFELINES

All critical facilities and infrastructure within the planning area face exposure to earthquake hazards. Disruptions to transportation corridors during seismic events may lead to hazardous material releases into the surrounding environment. Structural ruptures during earthquakes pose the risk of hazardous material leakage into the surrounding areas or nearby waterways, posing significant environmental threats.

The damage incurred by transportation corridors and communication lines could hinder the efficacy of first responders in post-earthquake response efforts. Government facilities and personnel within the incident area might require temporary relocation of operations due to damage. Local regulatory waivers may become necessary, and the public's confidence in the government's ability to respond and recover may be dimmish without timely and effective planning, response, and recovery measures.

Major earthquakes could necessitate disaster declarations and aid programs, potentially impacting funding and administrative resources allocated for regular operations or requiring alterations to existing operating procedures. HAZUS-MH 6.1 categorizes critical facilities' vulnerability to earthquake damage into two tiers: moderate damage or complete destruction. However, specific damages to facilities were not indicated in these categories through the analysis conducted for the Wyoming State Hazard Mitigation Plan. While the potential for damage to the transportation system and utility lifelines exists, precise loss figures at the county level were unavailable from the HAZUS analysis.

HAZUS-MH 6.1 simulation results classify the vulnerability of essential facilities to earthquake damage two ways, as experiencing at least moderate damage or complete damage. Simulation results are in the table below.

Figure 4-16 Expected Utility System Damage in Region 8

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	1	0	0	1
Waste Water	2	2	0	0	2
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	9	9	0	0	9

Source: HAZUS-MH 6.1 Global Summary Report, WSP Analysis

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

The environmental impacts of earthquakes can extend well beyond the immediate shaking of the ground, as secondary hazards triggered by seismic events often lead to even greater destruction. One of the most common and severe secondary effects are landslides. When earthquakes occur in hilly or mountainous terrain, the intense ground motion can destabilize slopes, triggering landslides that can devastate nearby ecosystems and habitats. These landslides can bury vegetation, alter the course of streams and rivers, and create debris flows that threaten both natural landscapes and built environments. In addition to direct physical

damage, landslides can also release large amounts of sediment into waterways, degrading water quality and disrupting aquatic habitats.

The destruction of historic buildings can have cascading social and economic effects. Beyond the immediate loss of culturally significant architecture, the damage or collapse of these buildings can lead to the displacement of residents and businesses, disrupting the community's fabric. Furthermore, the high cost of restoring or retrofitting historic structures to withstand future earthquakes can pose a substantial financial burden on property owners and local governments.

Land Use and Development Trends

In Teton County, development activities are regulated according to their Land Development Regulations, particularly in relation to seismic hazards. Unstable soils stipulates that no physical development, use, development options, or subdivision is permissible on unstable soil unless determined otherwise by the County Engineer, with certain exceptions. Foremost, it is important that all structures adhere to Building Codes concerning seismic hazards. Additionally, if proposed physical development lies within 200 feet of a fault line, the County Engineer may request a report from a geotechnical engineer registered in the State of Wyoming. Teton County and the Town of Jackson have recently adopted provisions ensuring that construction standards align with current seismic safety guidelines. The development trends in Teton County concerning earthquake resilience encompass a comprehensive strategy. This strategy integrates compliance with building codes, bolstering infrastructure resilience, thoughtful land-use planning, public education initiative, and effective emergency preparedness measures. Due to these initiatives' earthquake vulnerability has not increased within the County, Town of Jackson, or the Teton Conservation District due to growth and development since the last plan update.

Risk Summary

Overall, earthquake is considered a **high** significance hazard due to the presence of multiple faults and a history of damaging earthquakes. Teton County is located east of the Teton Fault, which is a significant geological feature known for its tectonic activity. According to the National Park Service the Teton Fault is still active, meaning that the fault has generated an earthquake within the past 10,000 years.

Table 4-23 Risk Summary by Jurisdiction: Earthquake

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	High	Widespread backcountry areas and transportation corridors in risk areas; some county roads affected.
Town of Jackson	High	Some potential to affect limited developed areas in Town limits
Teton Conservation District	High	TCD server at the TCD Office, while backed up, earthquake could quickly diminish TCD's responsiveness with data and information if the TCD Server failed.
Flat Creek Watershed Association	High	Earthquakes could cause landslides or avalanches off East Gros Ventre Butte into Flat Creek. This would cause catchment of water and cause property damage.
Jackson Hole Airport	High	Potential for runway infrastructure damage, damage to airport terminal and hangers, control tower, fueling facilities and vehicle gates. See asset list in Section 4.1.3.

4.2.5 Flood

Description

Flooding can be defined as the temporary inundation of normally dry land, often due to excessive rainfall, rapid snowmelt, or ice melt, and can be broken into two main categories: River Flooding and Flash Flooding.

Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt, or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms “base flood”, “100-year flood”, and “1% annual chance flood” refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are part of a larger entity called a basin, which is defined as all the land drained by a river and its branches.

Gauges along streams and rain gages throughout the state provide for an early flood warning system. River flooding usually develops over the course of several hours or even days depending on the basin characteristics and the position of the particular reach of the stream. The NWS provides flood forecasts for Wyoming. Flood warnings are issued over emergency alert system (EAS) radio and television messages as well as the NOAA Weather Radio People in the paths of river floods may have time to take appropriate actions to limit harm to themselves and their property.

A **flash flood** is an event that occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways, and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation. Flash Flood warnings also use EAS radio and the NOAA weather Radio, as well as Wireless Emergency Alerts.

Floods can and have caused significant damage in Region 8 and are one of the more significant natural hazards in the Region and the country as a whole. Floods can cause millions of dollars in damage in just a few hours or days. Causes of flooding relevant to the Region include:

- Rain in a general storm system
- Rain in a localized intense thunderstorm
- Melting snow
- Rain on melting snow
- Urban stormwater drainage
- Hail drifts clogging stormwater drainage
- Ice Jams
- Dam failure
- Levee Failure
- Rain on fire damaged watersheds
- Frazil Ice

The 100-year or 1% annual chance flood is the national standard to which communities regulate their floodplains through the National Flood Insurance Program. This is also called the Special Flood Hazard Area (SFHA) on flood insurance maps and in floodplain management ordinances.

The potential for flooding can change and increase through various land use changes and changes to land surface. A change in the built environment can create localized flooding problems inside and outside of natural floodplains, by altering or confining watersheds or natural drainage channels. These changes are commonly created by human activities. Flooding in the communities in Region 8 could be exacerbated by inadequate drainage and channel systems that would not stand up to the 1% annual chance flood. Inadequate culverts and drainage systems can flood adjacent properties.

Increased chance for flooding can also be created by other hazards such as wildfires. Wildfires create hydrophobic soils, a hardening or "glazing" of the earth's surface that prevents rainfall from being absorbed into the ground, thereby increasing runoff, erosion, and downstream sedimentation of channels.

FRAZIL ICE

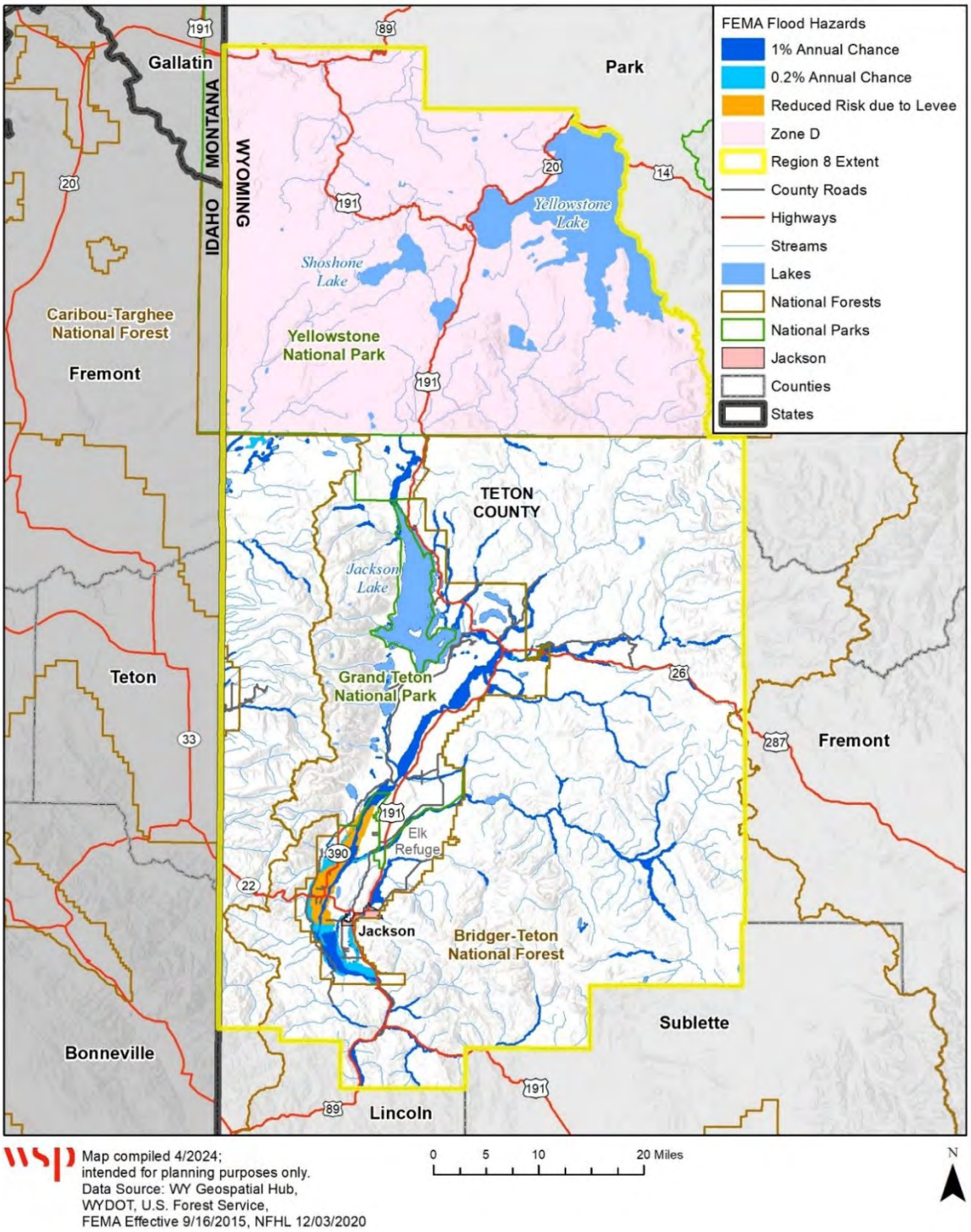
A unique phenomenon during winter months is the formation of Frazil or Anchor Ice, particularly in Flat Creek. Frazil ice is a collection of loose, randomly oriented ice crystals which form when water temperatures drop below freezing. The water becomes super cooled and the turbulence in the water causes small ice crystals to form and remain suspended in the water. Unlike regular ice, frazil ice is not buoyant and tends to accumulate on the upstream side of rocks and other objects in the stream bed. This causes the creek to freeze from the bottom up and creates two primary hazards: reducing the overall volume of the creek bed and forcing water out over the banks. When frazil ice becomes dislodged from its anchor on the creek bed it then floats to the top in large chunks. This can lead to the formation of ice jams that cause flooding by blocking the flow of water and causing an overflow on the banks sometimes resulting in a flash flood.

Location

Flood hazards throughout Region 8 exist along all major and minor rivers and streams throughout the county. Adequacy of storm drainage systems, presence of frazil ice, and other factors can contribute to, or exacerbate, flooding conditions in both Teton County and the Town of Jackson. Information reflected on the updated FIRM and FIS have been incorporated into this Plan. The main source of hazard data made available to the County and Town used in this plan to assess risk and vulnerability is the FEMA National Flood Hazard Layer data (effective 9/15/2015 plus all effective Letters of Map Revision as of 12/3/2020).

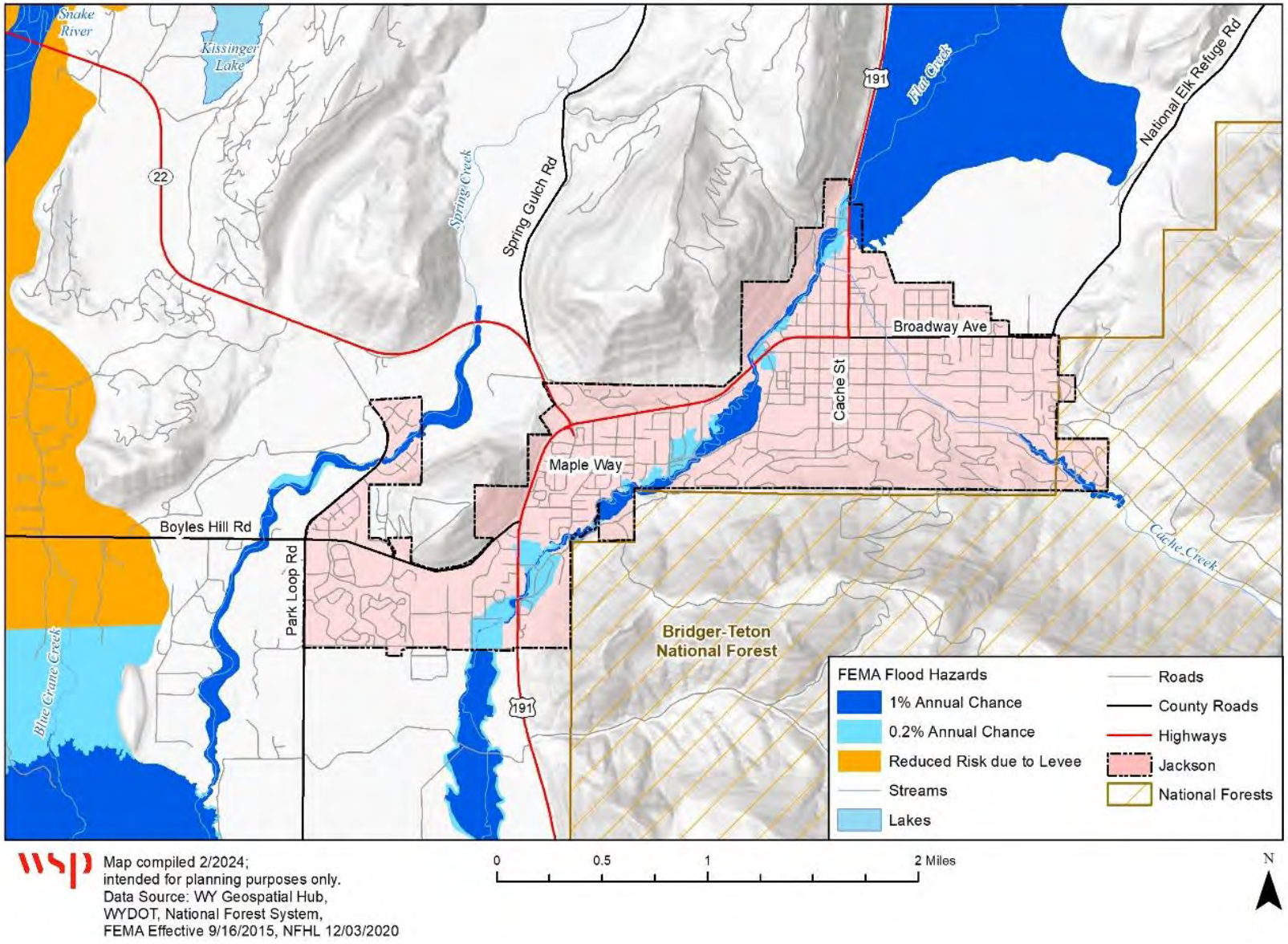
The streams studied in the county's FIS include the Snake and Gros Ventre Rivers; Flat, Fish, Teton, Lake, Cache, and Spring Creeks; and Buffalo Fork. Each of these waterways and their floodplains are shown in Figure 4-17.

Figure 4-17 Teton County/Region 8 FEMA Flood Hazards



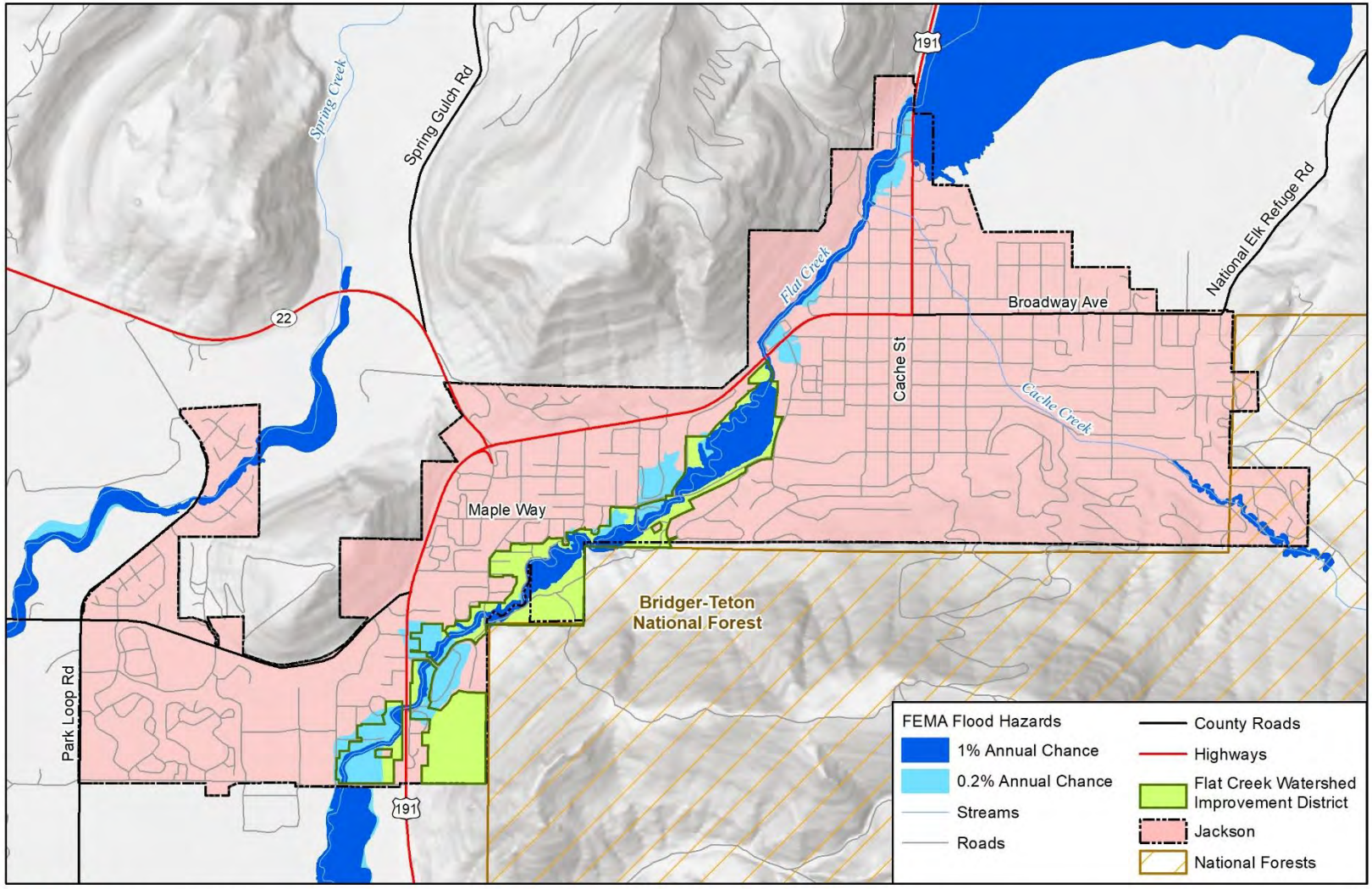
Within the Town of Jackson, most flooding originates from Flat Creek in the winter months. This is often the result of frazil ice buildup. Cache Creek also poses a risk, as does nuisance snowmelt flooding. See Figure 4-18 Jackson FEMA Flood Hazards and Figure 4-19 below.

Figure 4-18 Jackson FEMA Flood Hazards



Map compiled 2/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, National Forest System,
FEMA Effective 9/16/2015, NFHL 12/03/2020

Figure 4-19 Flat Creek Watershed Improvement District FEMA Flood hazards



Map compiled 4/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, U.S. Forest Service, FCWID,
FEMA Effective 9/16/2015, NFHL 12/03/2020

Extent (Magnitude)

Magnitude and severity can be described or evaluated in terms of a combination of the different levels of impact that a community sustains from a hazard event. Specific examples of negative impacts from flooding in Region 8 span a comprehensive range and are summarized as follows:

- Floods cause damage to private property that often creates financial hardship for individuals and families;
- Floods cause damage to public infrastructure resulting in increased public expenditures and demand for tax dollars;
- Floods cause loss of personal income for agricultural producers that experience flood damages;
- Floods cause loss of income to businesses relying on recreational uses of regional waterways;
- Floods cause emotional distress on individuals and families; and
- Floods can cause injury and death.

Flood recurrence intervals describe the statistical expectation of inundation frequency. Typical recurrence intervals include the list below, all of which can be experienced in Teton County:

- 10 years (10% probability of occurring in any given year)
- 25 years (4% probability of occurring in any given year)
- 50 years (2% probability of occurring in any given year)
- 100 years (1% probability of occurring in any given year)
- 500 years (0.2% probability of occurring in any given year)

Floods present a risk to life and property, including buildings, their contents, and their use. Floods can affect crops and livestock. Floods can also affect lifeline utilities (e.g., water, sewage, and power), transportation, jobs, tourism, the environment, and the local and regional economies. The impact of a flood event can vary based on geographic location to waterways, soil content and ground cover, and construction. The extent of the damage of flooding ranges from very narrow to widespread based on the type of flooding and other circumstances such as previous rainfall, rate of precipitation accumulation, and the time of year. Shallow flooding to flood depths of several feet are possible throughout the Region, depending on a variety of factors including the local topography, runoff, rainfall rate, and duration of precipitation.

Previous Occurrences

A brief history of the National Centers for Environmental Information (NCEI) recorded floods in the Region is presented in Table 4-24 below. This is not a complete record of all past events in the county but includes details from events which have been reported to the NCEI database where available.

Table 4-24 Teton County NCEI Flood Events, 1998 – 2023

TYPE	LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
Flood	Jackson	7/7/1998	$0	$0
Flash Flood	Wilson	7/26/2007	$50,000	$0
Flash Flood	Hoback Junction	8/17/2007	$10,000	$0

TYPE	LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
Flash Flood	Jackson	8/18/2007	$20,000	$0
Flood	Jackson	12/11/2011	$15,000	$0
Flash Flood	Jenny Lake	8/13/2014	$10,000	$0
Flood	Jackson Hole	3/23/2018	$10,000	$0
Flood	Valley	2/24/2023	$0	$0
		Total	$115,000	$0

Source: NCEI Data

Perhaps the most notable flood event in the county, and an infamous example of cascading hazard events, was the Kelly Flash Flood. On June 23, 1925, an unstable slope on the northern face of Sheep Mountain slid into the Gros Ventre River, resulting in a natural dam 200 feet high which created Lower Slide Lake. Nearly two years later on May 18, 1927, a portion of the natural dam suddenly broke and released a flash flood at least 6 feet deep for at least 25 miles downstream. The flood wiped out the town of Kelly and six people died, with significant property damage and agricultural losses as well. According to the Teton County Emergency Management website, hundreds of farm animals were killed and in Wilson 6 feet of water inundated the town, while narrower sections of the Snake River near Hoback, saw flood waters rise as much as 50 feet. The next day the waters reached Idaho Falls, ID and covered lowland sections there.

Observed flood discharges provide a means for tracking the magnitude and frequency of floods, no matter how large or how small. Tracking streamflow provides water and floodplain managers, as well as ecologists, climate scientists, water quality professionals, and others with an understanding of fluctuations in water levels resulting from rainfall, snowmelt, drought, and other climate impacts. In Teton County and the Town of Jackson, there are a total of 21 functioning stream gages actively measuring streamflow data.

Probability of Future Events

Flood probability, or frequency, is commonly based on the chance of flooding in any given year. Realistically, both Teton County and the Town of Jackson are prone to smaller but more frequent flooding events as a result of high snowfall totals and warming spring temperatures. Rainfall events occurring during Spring months can exacerbate flooding associated with snowmelt runoff. Larger flooding events are also possible under these same conditions.

Judging by the historical flood record for the Region, a flood of at least minimal magnitude occurs once every 3 years, on average, within the planning area. Most of these floods' extents were less than the 100-year flood; the chance of a 100-year flood occurring in any given year in the Region is 1%. Using the guidelines outlined in Section 4.1.1 a damaging flood has a **Likely** occurrence rating, meaning that a flood has a 10-100% chance of occurrence in the next year somewhere in the Region.

Climate Change Impacts

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. However, the hydrologic record cannot reliably be used to predict changes in frequency and severity of extreme climate events such as floods because this method of

forecasting assumes that the climate of the future will be similar to that of the period of historical record. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management, and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness, and emergency response.

Additionally, precipitation changes do not have a one-to-one relation with flooding. Many factors influence flooding, including presence of frozen soils, snowpack accumulation, storm tracks, and rainfall rates. According to the Fifth National Climate Assessment, trends show the Northern Great Plains region, which includes Wyoming in this report, would expect to see some of the highest increases in annual flooding damage costs in the contiguous US.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain area to contribute to peak storm runoff. High frequency flood events (e.g., 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

Vulnerability Assessment

PEOPLE

Vulnerable populations in Region 8 include residents living in known flood prone areas or near areas vulnerable to flash floods. Certain populations are particularly vulnerable. This may include the elderly and very young; those living in long-term care facilities; mobile homes; hospitals; low-income housing areas; temporary shelters; people who do not speak English well; tourists and visitors; and those with developmental, physical, or sensory disabilities. These populations may be more vulnerable to both the direct impacts of flooding, as well as experiencing increased difficulty in recovery, due to limitations in mobility and accessibility, income restrictions, challenges in receiving and understanding warnings, or unfamiliarity with surroundings.

During this Regional Plan's update, an estimate of the population exposed to flooding was created using a GIS overlay of latest National Flood Hazard Layer (NFHL), and HAZUS 100-year flood hazard areas where NFHL was not available, to determine potentially flooded parcels. The flood-impacted population for the region was then calculated by taking the number of residential units in the 100-year areas protected by levee, and 500-year floodplains and multiplying that number by the average household size of 2.33 for unincorporated residents per household and 2.45 within the Town of Jackson, based on the US Census Bureau's ACS estimates. The results for Teton County are displayed below in Table 4-25.

Table 4-25 Flood Vulnerable Population Estimate in Region 8

JURISDICTION	1% ANNUAL CHANCE FLOOD	0.2% ANNUAL CHANCE FLOOD	AREA PROTECTED BY LEVEE	TOTAL
Jackson	17	287	-	304
Unincorporated	347	543	3,786	4,676
Total	**364**	**830**	**3,786**	**4,980**

Source: Teton County, Wyoming CAMA 2024, FEMA NFHL, HAZUS, Census Bureau average household estimates, WSP GIS Analysis

BUILT ENVIRONMENT

A flood vulnerability assessment was performed for Region 8 using Geographic Information Systems (GIS). The flood vulnerability assessment was performed for Teton County using the following GIS methodology. The County's parcel layer, address point data, and associated assessor's building improvement valuation data were provided by the County and were used as the basis for the inventory. GIS was used to spatially join the address point layer to the County parcel layer to obtain the number of buildings per parcel. Only parcels with improvement values greater than zero were used in the analysis. This method assumes that improved parcels have a structure of some type. The latest 12/03/2020 FEMA National Flood Hazard Layer and a HAZUS 100-year flood layer, were used to supplement areas where FEMA had not mapped portions of Teton County, were then overlaid in GIS on the joined address point and parcel layers to identify structures that would likely be inundated during a 1% annual chance and 0.2% annual chance flood event. Building improvement values for those points were then extracted from the parcel/assessor's data and summed for each jurisdiction in the study area. Content values were estimated for the buildings based on their occupancy type, using FEMA methodology. This includes 100% of the structure value for agricultural, commercial, and exempt structures, 50% for residential structures, and 150% for industrial structures. Building and content values were totaled, and a 25% loss factor was applied to the totals, also based on FEMA depth damage functions (assuming a two-foot-deep flood). The summarized results for the Region are shown below in Table 4-26 through Table 4-28.

Table 4-26 Region 8 Parcels at risk to FEMA and HAZUS 1% flood hazards by jurisdiction

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE	ESTIMATED LOSSES
Jackson	Commercial	2	43	$19,193,182	$19,193,182	$38,386,364	$9,596,591
	Residential	7	7	$3,018,864	$1,509,432	$4,528,296	$1,132,074
	Total	**9**	**50**	**$22,212,046**	**$20,702,614**	**$42,914,660**	**$10,728,665**
Unincorporated	Agricultural	6	6	$10,913,323	$10,913,323	$21,826,646	$5,456,662
	Residential	148	149	$405,555,124	$202,777,562	$608,332,686	$152,083,172
	Total	**154**	**155**	**$416,468,447**	**$213,690,885**	**$630,159,332**	**$157,539,833**
	Grand Total	**163**	**205**	**$438,680,493**	**$234,393,499**	**$673,073,992**	**$168,268,498**

Source: Teton County, Wyoming CAMA 2024, FEMA NFHL Effective Date 9/16/2015, HAZUS, WSP GIS Analysis

Table 4-27 Region 8 Parcels at risk to FEMA 0.2% flood hazards by jurisdiction

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE	ESTIMATED LOSSES
Jackson	Commercial	31	80	$73,081,417	$73,081,417	$146,162,834	$36,540,709
	Multi-Use	1	3	$54,607	$54,607	$109,214	$27,304
	Residential	114	114	$95,655,002	$47,827,501	$143,482,503	$35,870,626
	Total	**146**	**197**	**$168,791,026**	**$120,963,525**	**$289,754,551**	**$72,438,638**
Unincorporated	Agricultural	7	12	$12,800,717	$12,800,717	$25,601,434	$6,400,359
	Commercial	12	13	$26,168,186	$26,168,186	$52,336,372	$13,084,093
	Residential	232	233	$631,895,087	$315,947,544	$947,842,631	$236,960,658
	Total	**251**	**258**	**$670,863,990**	**$354,916,447**	**$1,025,780,437**	**$256,445,109**
	Grand Total	**397**	**455**	**$839,655,016**	**$475,879,972**	**$1,315,534,988**	**$328,883,747**

Source: Teton County, Wyoming CAMA 2024, FEMA NFHL Effective Date 9/16/2015, WSP GIS Analysis

Table 4-28 Region 8 Parcels at risk to FEMA Area Protected by Levee flood hazards by jurisdiction

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE	ESTIMATED LOSSES
Unincorporated	Agricultural	14	14	$30,734,697	$30,734,697	$61,469,394	$15,367,349
	Com Vacant Land	2	4	$368,384	$368,384	$736,768	$184,192
	Commercial	52	59	$115,245,119	$115,245,119	$230,490,238	$57,622,560
	Multi-Use	2	2	$4,995,641	$4,995,641	$9,991,282	$2,497,821
	Res Vacant Land	2	2	$484,230	$242,115	$726,345	$181,586
	Residential	1,591	1,621	$4,915,740,370	$2,457,870,185	$7,373,610,555	$1,843,402,639
	Total	**1,663**	**1,702**	**$5,067,568,441**	**$2,609,456,141**	**$7,677,024,582**	**$1,919,256,146**

Source: Teton County, Wyoming CAMA 2024, FEMA NFHL Effective Date 9/16/2015, WSP GIS Analysis

NFIP CLAIMS ANALYSIS

Another method of examining the magnitude and severity of flooding in the Region is to examine the damage losses and payments from the National Flood Insurance Program (NFIP). Teton County and the Town of Jackson are both participants in the NFIP. This information is not comprehensive, because it only reflects the communities that participate in the NFIP, but it is a useful overview of flood damages in the region. The information summarized in Table 4-29 below represents the composite of unincorporated and community-specific policies, claims and payments. According to statistics from the National Flood Insurance Program (http://www.fema.gov/policy-claim-statistics-flood-insurance/policy-claim-statistics-flood-insurance/policy-claim-13) there have been a total of 24 flood insurance claims filed between 1/1/1978 and 02/02/2024 in the region. The total payments made on these claims was $116,896. As of 02/02/2024, there were 349 flood insurance policies in force in the Region for a total coverage of $119,944,000.

Table 4-29 NFIP Policy and Insurance Claim Data for Region 8

LOCATION	POLICIES	COVERAGE "INSURANCE IN FORCE"	# OF CLAIMS "CLOSED PAID LOSSES"	PAID LOSSES "$ OF CLOSED PAID LOSSES"	REPETITIVE LOSSES	SUBSTANTIAL DAMAGE CLAIMS	# OF POLICIES IN A ZONES	# OF POLICIES IN **NON-A** ZONES
Town of Jackson	46	$13,644,000	2	$6,613	0	0	11	35
Teton County	303	$101,300,000	22	$110,284	0	0	29	272
Region Total	**349**	**$114,944,000**	**24**	**$116,896**	**0**	**0**	**40**	**307**

Source: FEMA Policy and Claim Statistics http://www.fema.gov/policy-claim-statistics-flood-insurance and State of Wyoming Department of Homeland Security, NFIP Coordinator as 05/2022

Repetitive Loss is defined as an NFIP Insured property that has experienced 4 or more paid losses in excess of $1,000, two paid losses in excess of $1,000 within any rolling 10-year period, or three or more paid losses that equal or exceed the current value of the insured property. Neither Teton County nor the Town of Jackson have any listed repetitive loss properties or severe repetitive loss properties at the time of this risk assessment in 2024.

ECONOMY

Flooding can have a major negative impact on the economy. Based on the flood loss analysis, there are 43 commercial structures worth an estimated $38.4 million in total value directly at risk to flooding in the 1% annual chance floodplain, and 93 commercial structures worth $198.5 million located in the 0.2% annual chance floodplain. Based on the loss analysis this could result in approximately $59 million in direct losses. This does not account for other indirect losses such as business interruption, reduced tourism and visitation, lost wages, and other downtime costs.

These indirect losses can also have a significant economic cost. Flood events can cut off customer access to a business as well as close a business for repairs or permanently. A quick response to the needs of businesses affected by flood events can help a community maintain economic vitality in the face of flood damage. Responses to business damages can include funding to assist owners in elevating or relocating flood-prone business structures.

CRITICAL FACILITIES AND LIFELINES

GIS analysis of flood hazards in Region 8 indicates that there are 66 critical facilities and/or community assets that are potentially exposed to flood hazards. There are 57 facilities in the 1% annual chance floodplain shown in Table 4-30, nine in the 0.2% annual chance floodplain shown in Table 4-31 and 17 facilities within the areas protected by levee. One limitation to the HIFLD data is a lack of potable water facilities. Gaining access to this type of information would enhance the results of the critical facility risk analysis. Replacement values were not available with the data; thus, an estimate of potential monetary loss could not be performed. Impacts to any of these facilities could have wide ranging ramifications, in addition to property damage and other cascading impacts.

Table 4-30 Critical Facilities at Risk to 1% Annual Chance Flood Hazard (FEMA & HAZUS) by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNTY
Jackson		-	-	-	-	-	5	-	-	**5**
Unincorporated	-	1	-	1	-	3	45	3	-	**53**
Total	**0**	**1**	**0**	**1**	**0**	**3**	**50**	**3**	**0**	**58**

Source: Teton County, FEMA NFHL & HAZUS, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

Table 4-31 Critical Facilities at Risk to 0.2% Annual Chance Flood Hazard (FEMA) by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	1	2	-	-	-	-	-	-	**3**
Unincorporated	1	-	-	3	-	1	-	2	2	**9**
Total	**1**	**1**	**2**	**3**	**0**	**1**	**0**	**2**	**2**	**12**

Source: Teton County, FEMA NFHL, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

Table 4-32 Critical Facilities at Risk to Areas Protected by Levee Flood Hazard (FEMA) by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	-	-	-	-	-	-	**0**
Unincorporated	1	2	-	2	2	8	1	2	1	**19**
Total	**1**	**2**	**0**	**2**	**2**	**8**	**1**	**2**	**1**	**19**

Source: Teton County, FEMA NFHL, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

District specific GIS analysis did not yield risk to FCWID, Teton Conservation District, or Airport facilities.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

The natural environment is generally resilient to impacts of flooding, as flooding is a natural and necessary process for the overall health of ecosystems. However, areas where natural landscapes and soil compositions have been altered by human development or after periods of previous disasters such as drought and fire can see increased vulnerability to flooding. Wetlands, for example, exist because of natural flooding incidents. Areas that are no longer wetlands may suffer from oversaturation of water, as will areas that are particularly impacted by drought. Areas recently suffering from wildfire damage may see increased erosion because of flooding, which can permanently alter an ecological system.

Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams. During floods, these can settle onto normally dry soils, polluting them for agricultural uses. Human development such as bridge abutments can increase stream bank erosion, causing rivers and streams to migrate into non-natural courses.

Tourism and outdoor recreation are a vital part of the Region's economy. If part of the planning area were significantly damaged by flooding, tourism and outdoor recreation could potentially suffer. Areas of downtown Jackson with historic buildings may have a risk of flooding as well.

In November 2016, Teton Conservation District (TCD), with funding from the Wyoming Water Development Office (WDDO), completed a watershed study in the Upper Snake River Basin. The purpose of the study was to evaluate watershed conditions, needs, and opportunities on irrigated lands, range lands, wetlands and streams. The result of the study was a watershed plan created by the project consultants, Olsson Associates, outlining possible land and water improvements that could be made in partnership with landowners. While this Plan has a larger focus than just flooding and floodplain management, it includes issues discussion and watershed management approaches for dealing with flooding, flood mitigation, and floodplain use and development. Specifically, the study discusses:

- Fish passage for native species as it applies to stormwater infrastructure and mitigation design
- Engineered wetland design for flood, water quality, and ecosystem mitigation
- Winter flooding along Flat Creek that continues to impact the residents of Jackson

- Water availability for fire suppression throughout the planning area (an important consideration for wildland fire fighting)
- Levee improvements (along the Snake River and elsewhere) to provide continued flood protection

Land Use and Development Trends

No specific new growth or development within the County, Town of Jackson, or the Teton Conservation District in the past five years has significantly altered the general flood risk of the area. For the NFIP participating communities of Teton County and Town of Jackson, floodplain management practices implemented through local floodplain management ordinances is intended to promote wise use flood hazard areas and mitigate the flood risk to new development in floodplains.

Risk Summary

Overall, flooding is a **high** significance hazard in the region. The Region floods, on average, once every few years, having damaged homes, infrastructure (roads, railroads, bridges, culverts), and causing agricultural losses in the past. Flood risk varies by jurisdiction and this risk is summarized in the table below.

Table 4-33 Risk Summary by Jurisdiction: Flood

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	High	Development in Snake River corridor in risk areas; some county roads affected including state highway bridges.
Town of Jackson	Medium	Residential and commercial development along Flat Creek at risk. Substation on Flat Creek at intersection of Karns Meadow Dr and W Snow King Ave
Teton Conservation District	Medium	Not considered to have significant impacts to District facilities.
Flat Creek Watershed Association	Medium	Residential and commercial development along Flat Creek at risk.
Jackson Hole Airport	Medium	Not in dam or levee inundation area but some stormwater drainage issues.

4.2.6 Landslide

Description

A landslide is a variety of mass movement processes that generate a downslope movement of soil, rock, and vegetation under gravitational influence. Landslides are a serious geologic hazard common to almost every state in the United States. It is estimated by the U.S. Geological Survey that nationally they cause between $2 billion and $4 billion in damages, and from 25 to 50 deaths annually. While some landslides develop gradually, others strike suddenly, fueled by factors like water saturation, erosion, construction, human activity, loss of vegetation from wildfires, alternate freezing or thawing, seismic activity, and volcanic eruptions.

Areas that are generally prone to landslide hazards include existing old landslides; the bases of steep slopes; the bases of drainage channels; and developed hillsides where leach-field septic systems are used. Landslides are often a secondary hazard related to other natural disasters such as rainstorms and earthquakes.

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompany these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Generally, significant land sliding follows periods of above-average precipitation over an extended period. It is on these days of intense rainfall that slides are most likely.

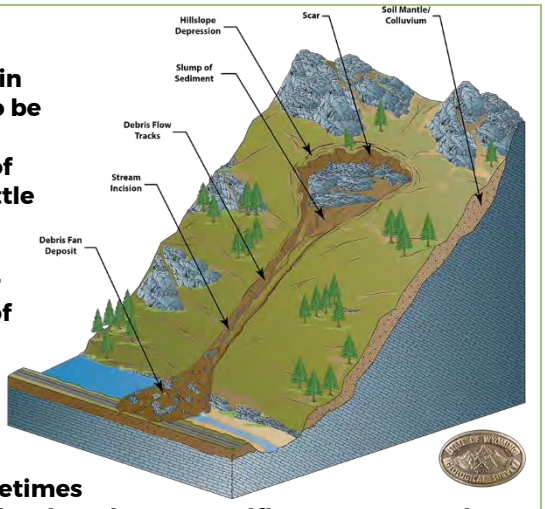
Slope failures typically damage or destroy portions of roads, sewer and water lines, homes and public buildings, and other utility lines. Even small-scale landslides are expensive due to clean-up costs that may include debris clearance from streets, drains, streams and reservoirs; new or renewed support for road embankments and slopes; minor vehicle and building damage; personal injury; and livestock, timber, crop and fencing losses and damaged utility systems.

There are many types of landslides present in Wyoming. To properly describe landslide types, the Geologic Hazards Section of the Wyoming State Geological Survey developed a landslide classification modified from Varnes (1978) and Campbell (1985) seen in Figure 4-20. The classification includes type of movement (falls, topples, slides, lateral spreads, and flows) and the type of material (bedrock, debris, and earth). While individual landslide types can occur in nature, most landslides are complex or composed of combinations of basic types of landslides.

Table 4-34 Landslide Classification

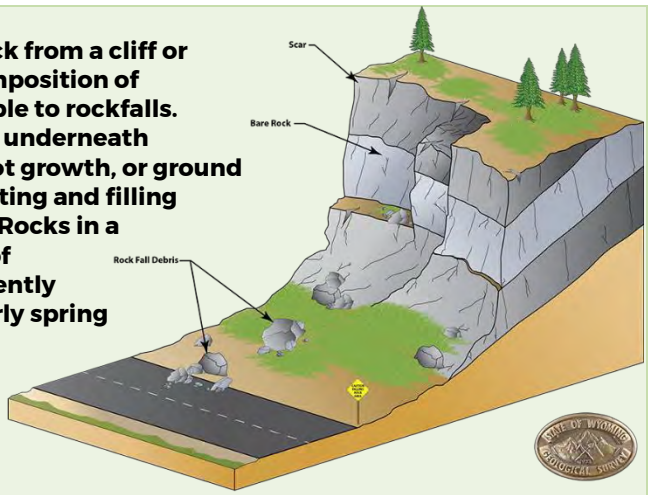
Debris Flow

A mass of loose, water-laden, and poorly sorted debris of fragmented rock, soil, and mud that surges down a slope in response to gravitational processes. Debris flows can also be referred to as mudslides, mudflows, lahars, or debris avalanches. These flows generally occur during periods of intense rainfall or rapid snowmelt and may occur with little onset warning, similar to a flash flood. They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 miles per hour but can exceed 35 miles per hour. The consistency of debris flow ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and even cars. Debris flows from many different sources can combine in channels, and their destructive power may be greatly increased. When the flows reach the flatter ground, the debris spreads over a broad area, sometimes accumulating in thick deposits that can wreak havoc in developed areas. Mudflows are covered under the National Flood Insurance Program; however, landslides are not.



Falls

A rockfall is the falling of a detached mass of rock from a cliff or down a very steep slope. Weathering and decomposition of geological materials produce conditions favorable to rockfalls. Rockfalls are caused by the loss of support from underneath through erosion or triggered by ice wedging, root growth, or ground shaking. Changes to an area or slope such as cutting and filling activities can also increase the risk of a rockfall. Rocks in a rockfall can be of any dimension, from the size of baseballs to houses. Rockfalls occur most frequently in mountains or other steep areas during the early spring when there is abundant moisture and repeated freezing and thawing. Rockfalls are a serious geological hazard that can threaten human life, impact transportation corridors and communication systems, and result in other property damage.



Spring is typically the landslide/rockfall season in Wyoming as snow melts and saturates soils and temperatures enter into freeze/thaw cycles. Rockfall and landslides are influenced by seasonal patterns, precipitation, and temperature patterns. Earthquakes could trigger rockfalls and landslides too.

Topples

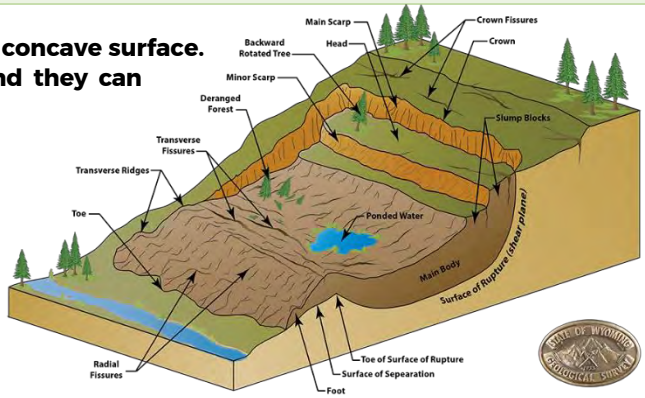
Comparable to falls, but the primary motion involves forward rotation and mass movement of rock or debris out of a slope face.

Creep

Slow movement of a material down a slope.

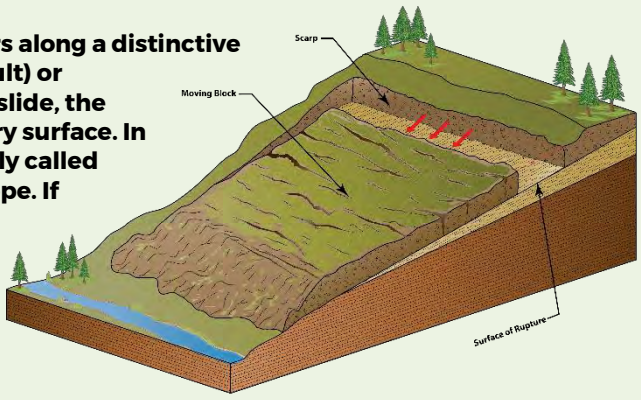
Rotational (slump)

Block of material moving down a slope along a concave surface. Rotational slides are usually called slumps, and they can occur in bedrock, debris, or earth.



Translational (slide)

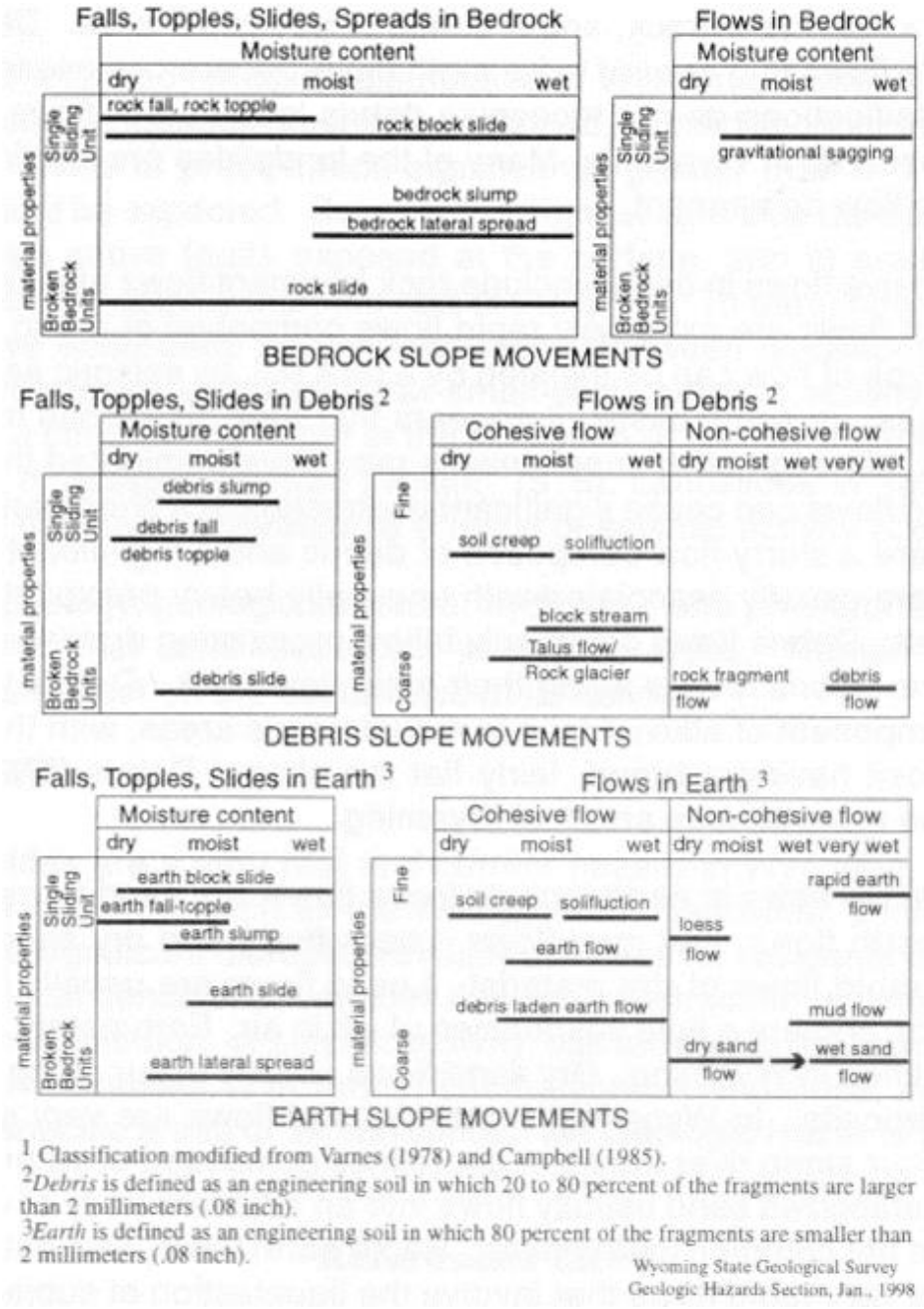
Block of material moving down-slope that occurs along a distinctive surface of weakness (soil horizon, bedding or fault) or parallel to the ground surface. In a translational slide, the surface of rupture is a planar or gently undulatory surface. In bedrock and earth, translational slides are usually called block slides if an intact mass slides down the slope. If rock fragments or debris slide down a slope on a distinct shear plane, the movements are called rockslides or debris slides.



Lateral spreads

Lateral spreads are characterized by lateral extension movements in a fractured mass. Lateral spread movements may occur in bedrock and soil due to liquefaction or plastic flow of subjacent materials, or in bedrock without a well-defined basal shear surface or zone of plastic flow. Lateral spreads in bedrock without a well-defined zone of shearing or flow, usually occur on ridge crests.

Figure 4-20 Wyoming Landslide Classifications



Source: Wyoming State Geological Survey

Location

Landslides are one of the most common geologic hazards in Wyoming. Landslides occur every year in Wyoming. The area susceptible to landslides is primarily outside of municipalities in more remote areas, however, there is a great deal of outdoor recreation trails and roadways that exist in this overlay. Figure 4-21 shows the significant geographic extent of landslide susceptibility in the County. When landslides do occur in populated areas, they can cause significant damage and loss of life.

Figure 4-22 shows the Town of Jackson is susceptible to landslides on the outskirts of the planning area. Landslide prone areas include existing old landslides, the bases of steep slopes, the bases of drainage channels, and developed hillsides where leach-field septic systems are used. Areas that are typically considered safe from landslides include areas that have not moved in the past, relatively flat-lying areas away from sudden changes in slope, and areas at the top or along ridges, set back from the tops of slopes.

Figure 4-21 Wyoming Region 8 Landslide Susceptibility

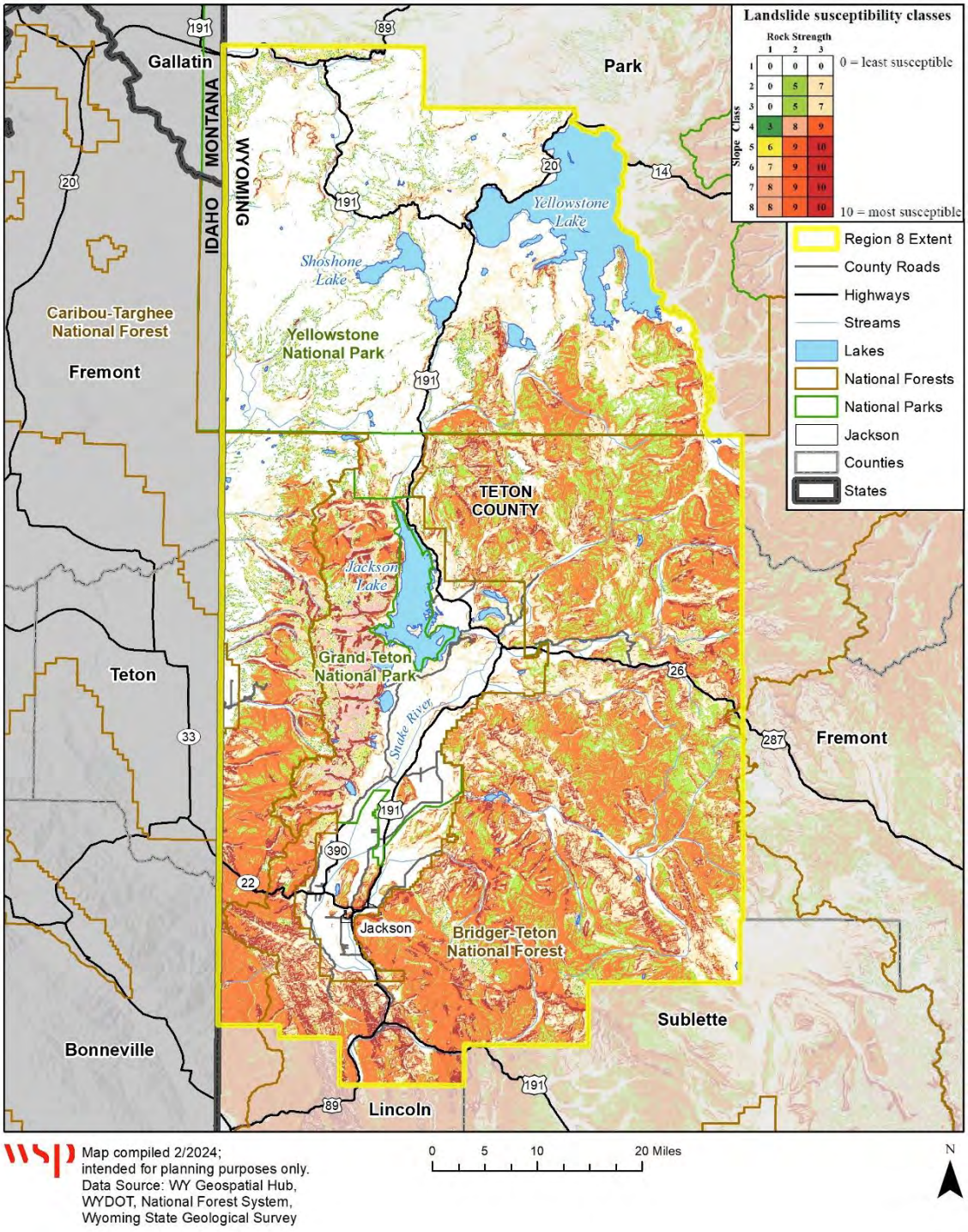
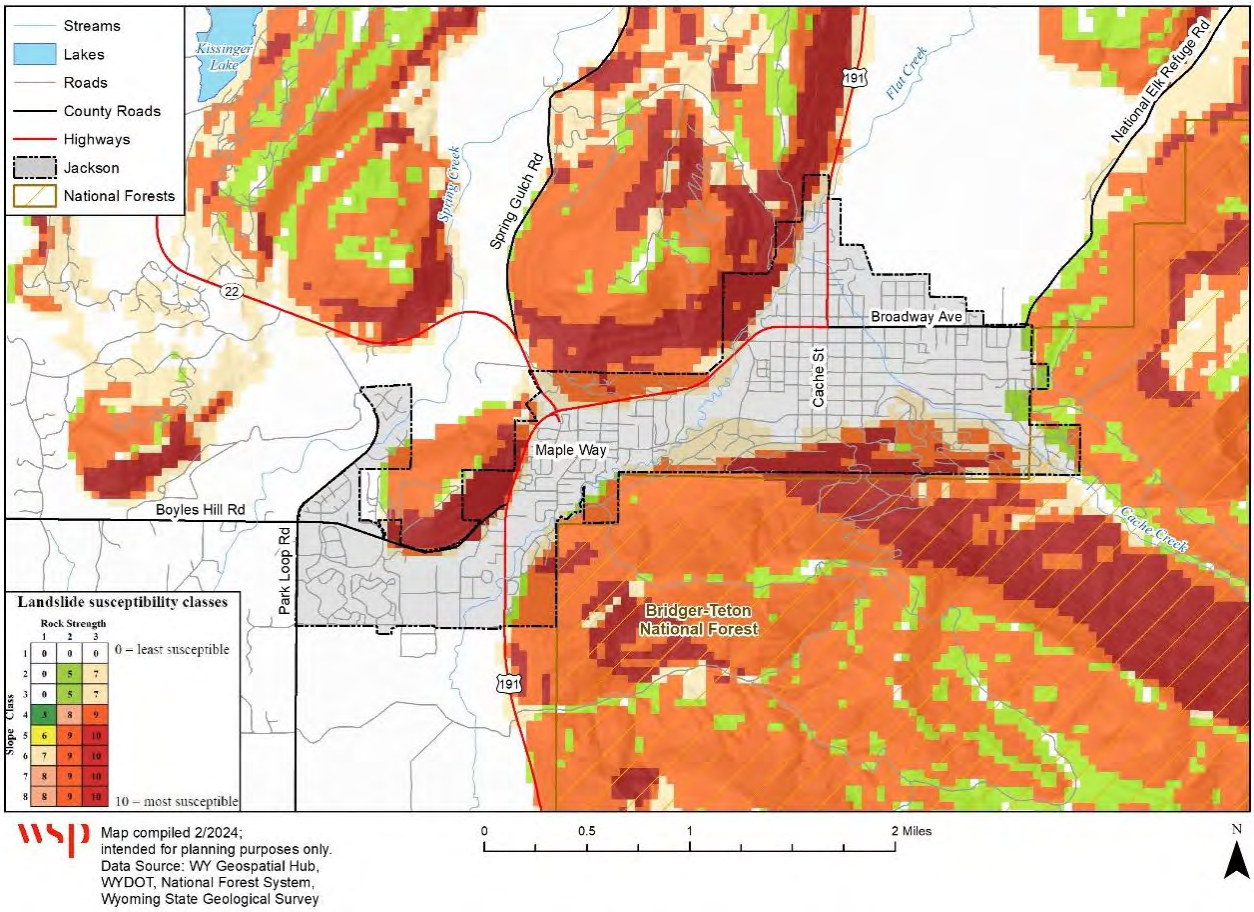
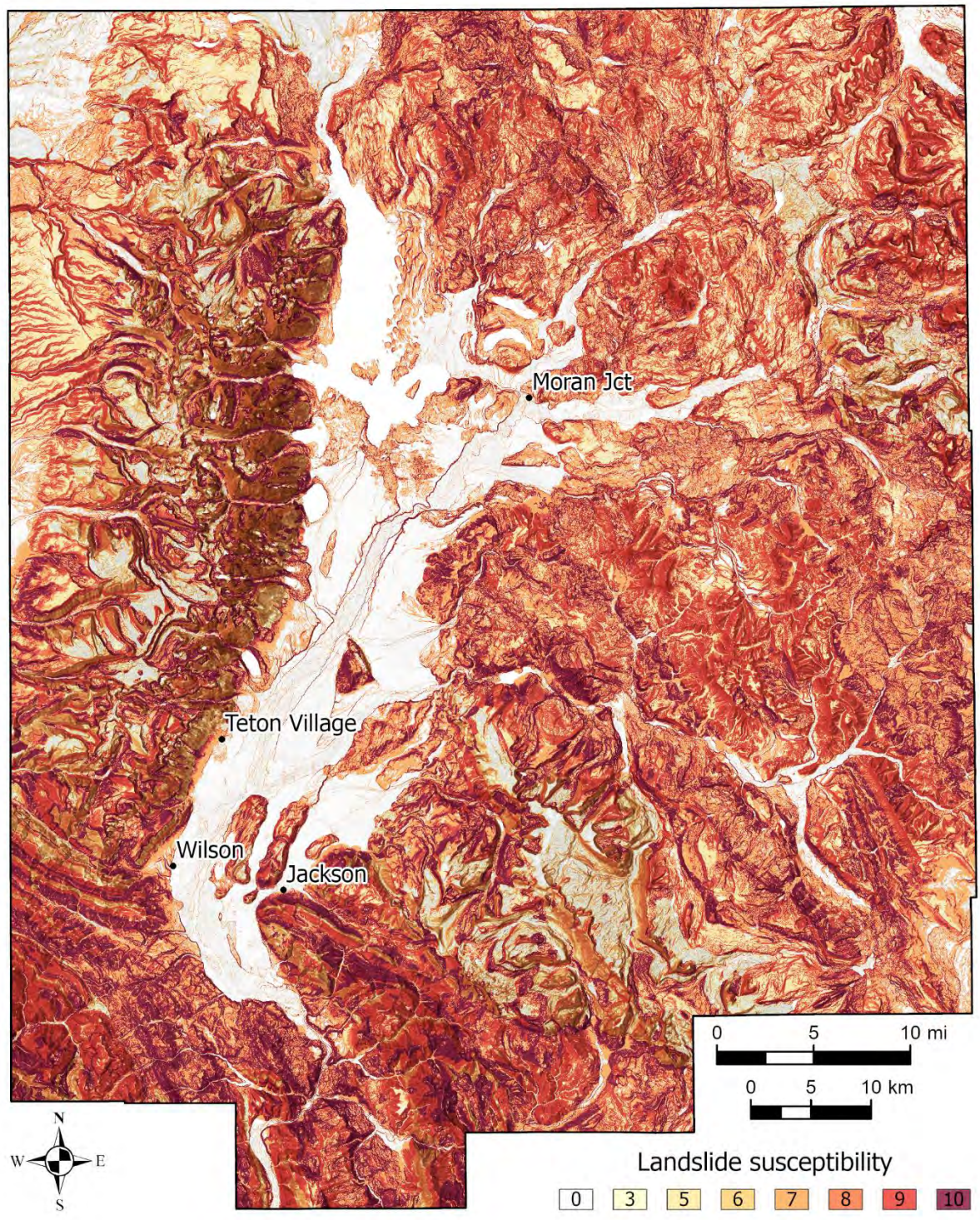


Figure 4-22 Landslide Susceptibility in Jackson



To improve upon future understanding of landslide vulnerability in Region 8, Wyoming State Geological Survey (WSGS) has also been developing new, high-resolution landslide susceptibility mapping, shown in Figure 4-23 below. This map is a preliminary map of susceptibility to deep-seated landslides in southern Teton County, primarily highlighting the vicinity of Jackson Hole. Landslide susceptibility is classified into eight bins, with higher numbers and darker colors representing greater susceptibility. The susceptibility raster has a 10-meter resolution and was produced by intersecting data on rock strength (from geologic maps, primarily 1:24,000-scale) and slope angle (from bare-earth lidar digital elevation models, down-sampled to 10-meter resolution) following methods modified from Wittke and Stafford (2019) and references therein. This susceptibility map is an unpublished draft as of December 2024, and it will be superseded by a forthcoming WSGS publication. This preliminary figure is not for distribution or use outside of the Teton County Hazard Mitigation Plan.

Figure 4-23 Preliminary Landslide Susceptibility Map of Jackson Hole



Source: Wyoming State Geological Survey, December 2024

Extent (Magnitude)

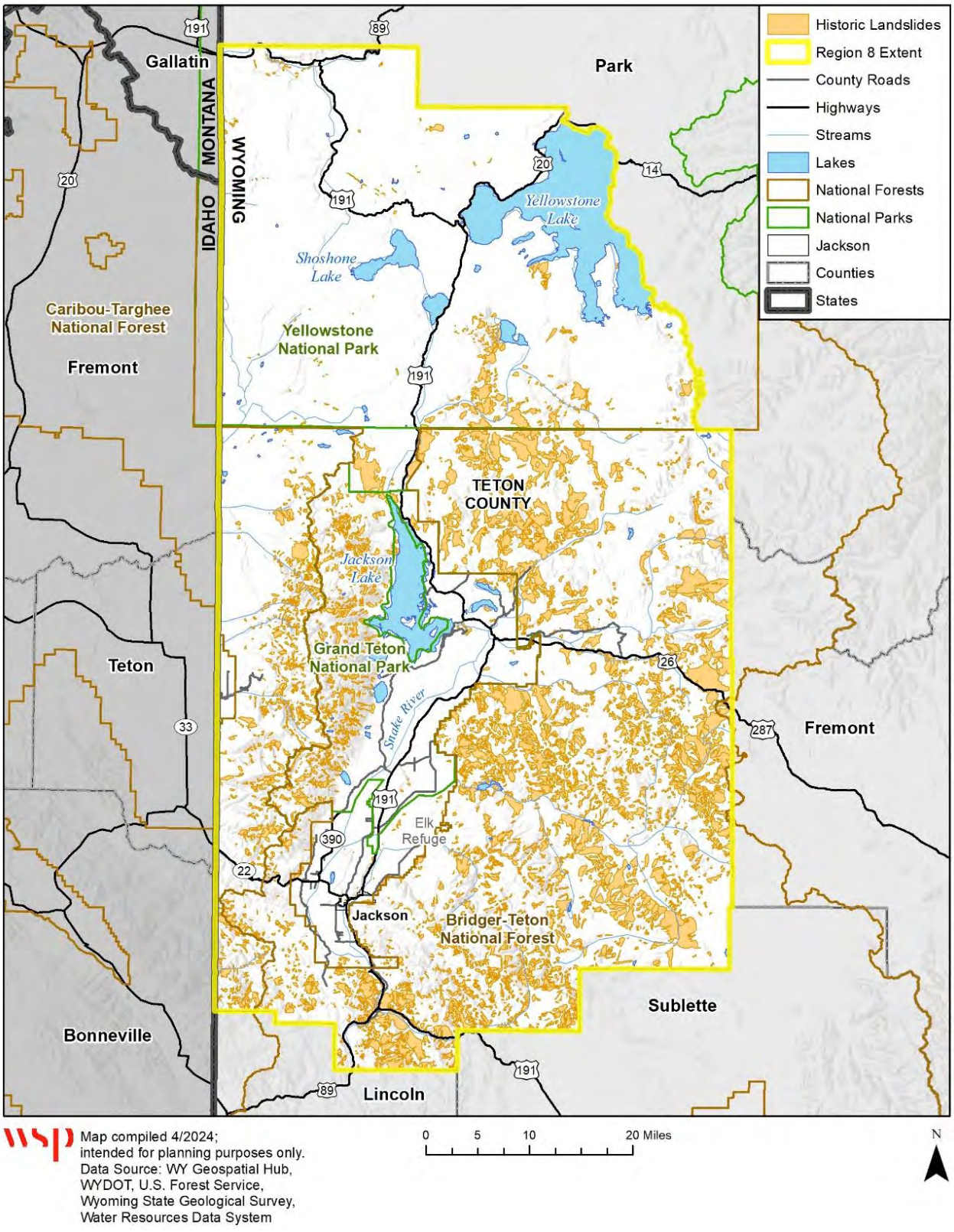
There are three measures of future landslide impacts – historic dollar damages, estimated yearly damages, and building exposure values. There is not enough current data to estimate

historic or yearly dollar damages. In general terms, landslides can threaten human life, impact transportation corridors and communication systems, and cause damage to property and other infrastructure. Actual losses can range from mere inconvenience based on inability to access roads, to high maintenance costs where even very slow or small-scale destructive slides are involved. The potential magnitude of landslides, rockfall and debris flows would typically be isolated in the region, given that most landslide events occur in mountainous areas away from city limits. However, even a small, isolated event has the potential to close state or U.S. highways in the region, resulting in long detours for days or weeks. With the added cost of detours and the potential for life safety impacts, some landslides could have greater costs.

Previous Occurrences

Landslides, debris flows, and rockfalls occur regularly in Wyoming and the Region, though limited information was available on previous occurrences that caused a particularly high amount of damage or incurred some other cost or unique impact. Figure 4-24 displays data on historical landsides in Teton County, which has a primary concentration in mountainous areas. Additionally, Figure 4-25 shows historic landslide events in the Town of Jackson, which has occurred along its city limits. Landslides of note in Region 8 are listed in Table 4-35 and described below.

Figure 4-24 Region 8 Historic Landslides



Map compiled 4/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, U.S. Forest Service,
Wyoming State Geological Survey,
Water Resources Data System

Figure 4-25 Jackson Historic Landslides

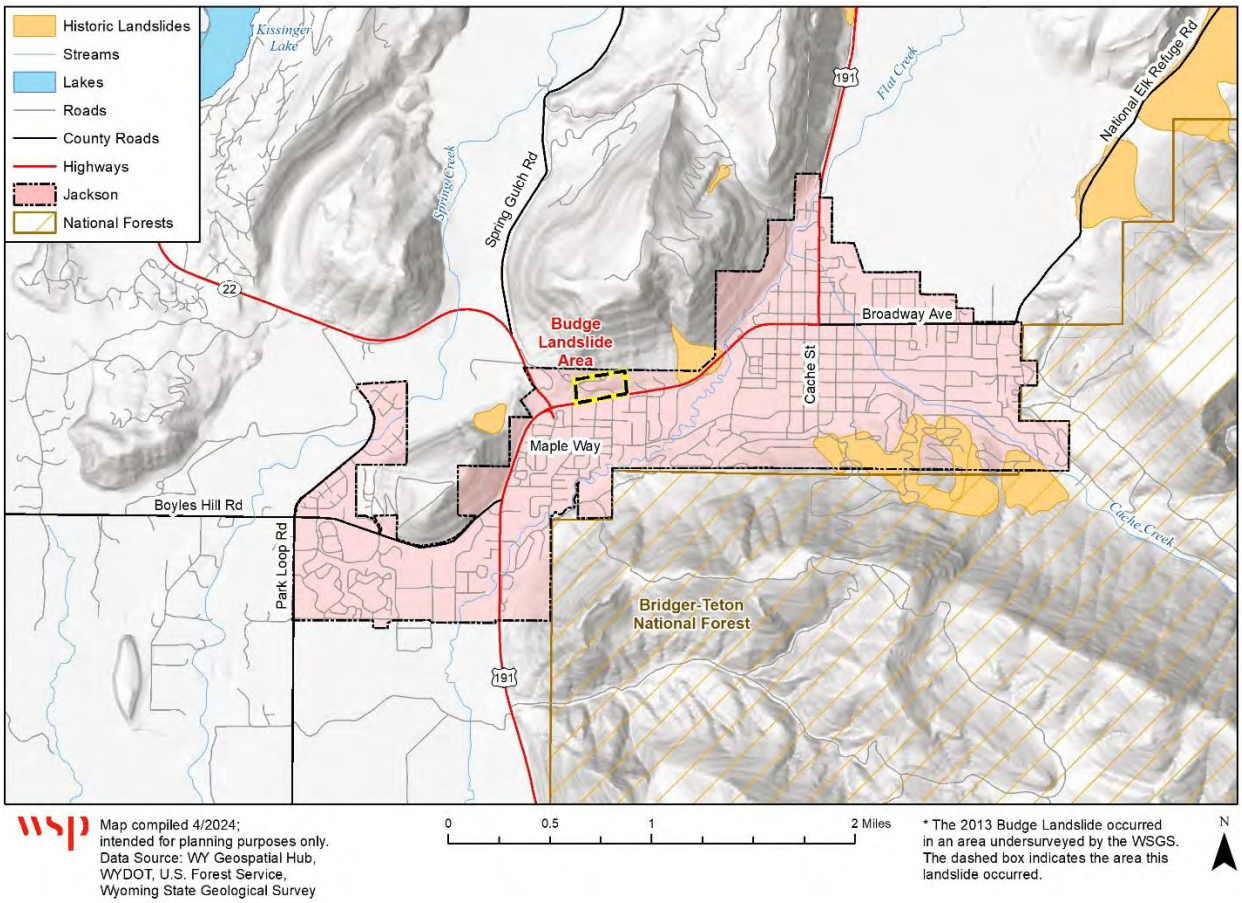


Table 4-35 Landslides of Note in Wyoming Region 8

LANDSLIDE REFERENCE NAME	YEAR
Gros Ventre Slide	6/22/1925
Crystal Peak Slide	2007-2012
Double Draw Slide	5/14/2011
West Broadway (Budge) Slide	5/16/2014
Teton Pass	5/8/2016
Cave Falls	6/7/2016
Granite Creek Earthquake	8/27/2016
Avalanche on Teton Pass	12/16/2016
Twin Pine Landslide on Highway 89	3/16/2017
Porcupine Landslide	2/8/2018
Budge Drive Slide	8/3/2018
WY22 and Hoback Canyon	4/10/2023
Periodic Springs Trail Mudslide	6/15/2023
Teton Pass Highway 22 Landslide/Embankment Failure	6/8/2024

Source: NASA Landslide Viewer

GROS VENTRE SLIDE

In the 1920s, persistent small earthquakes shook parts of Teton County, particularly the eastern side, culminating in a magnitude 4 earthquake on June 22, 1925. The following day, a local farmer witnessed a 30-to-40-foot-high riverbank collapse into the Gros Ventre River, triggering the catastrophic Gros Ventre Slide. This event, estimated to have moved 50 million cubic yards of debris over 1.5 miles, formed Lower Slide Lake when it dammed the river. Although no casualties occurred during the slide, a flash flood resulting from the dam's breach claimed six lives in the town of Kelly two years later.

CRYSTAL PEAK SLIDE

In 2007, significant movement of earth on the northern flank of Crystal Peak in the Gros Ventre Wilderness caused the descent of bus-sized boulders, trees, silt, dirt, and mud into the valley below. Subsequent years saw the continuation of this process, with silt and sediment from the upper mountain forming an alluvial fan feature in 2008, diverting Crystal Creek across the valley. Further flows in 2009 and 2010 deepened the valley with rock and sediment, while in 2012, the emergence of Crystal Lake marked the formation of a lake above the earthen obstruction of Crystal Creek. These slides prompted significant alterations to the Crystal Creek Trail by Bridger-Teton National Forest staff, impacting recreational access and travel within the Gros Ventre Wilderness area.

Crystal Peak Slide. Photo courtesy Dina Mishev- Jackson Hole Magazine

DOUBLE DRAW SLIDE

The state experienced record snowpack and above-average precipitation in the spring of 2011, leading to a significant landslide in Snake River Canyon on May 14, 2011. This slow-moving mass of mud, rock, and trees crossed South Highway 89, blocking approximately 300 feet of the road and covering the pavement to depths of up to 50 feet before flowing into the Snake River. The landslide spanned about 2,000 feet, and contractors removed an estimated 200,000 cubic yards of debris. The closure of the commuter corridor for residents of Alpine and Star Valley lasted nearly two weeks, forcing the approximately 5,740 vehicles that commute to and from Jackson each day to take a 74-mile detour through Idaho and Teton Pass. In response to the severe storms, flooding, and landslides affecting multiple counties, President Obama declared a major disaster for the State of Wyoming on July 22, 2011.

Photo courtesy Teton Squadron Civil Air Patrol

WEST BROADWAY (BUDGE) SLIDE

The Budge Drive Landslide (later named the West Broadway Slide) originated behind a steep rock face formed by extensive quarrying from the late 1950s to the 1970s. With slopes up to 55 degrees, significantly steeper than the region's typical 15-degree slopes, the site became destabilized. The presence of highly fractured andesite overlying clays facilitated water flow, creating conditions for potential slipping.

On May 29, 2014, a high rate of precipitation and snow melt triggered rapid motion of this slide. But the fractures surrounding the slide mass began to form and nucleate by the fall to winter of 2011, potentially influenced by factors like a water leak, quarrying, or previous instability. Deformation of a home at 1045 Budge Drive began in fall to winter 2011, escalating to significant sinking by April 2014, accompanied by movement of the landslide's toe towards West Broadway, prompting considerations for future slope stability measures by the Town of Jackson and Teton County.

Photo courtesy JH News and Guide

In 2018, Budge Drive experienced another slow-moving landslide as a result of heavy rain and snowmelt. The slide moved on average, a quarter-inch every month and an inch during wet weather. The slide cut off access to a 60-person neighborhood and threatened town utilities, including a water line.

2024 TETON PASS (BIG FILL) LANDSLIDE

June 8, 2024, a 10 mile stretch of Teton Pass closed due to a landslide/highway embankment failure on Highway 22 which caused significant impacts to the area's workforce and economy. The slide impacted at least 2,500 people that live on the other side of the pass who commute to work, or 15% of Teton County's workforce. This event led to the catastrophic failure of the roadway. On June 21st the U.S. Department of Transportation awarded the WYDOT $6 million to offset the costs of repairs as well as make a detour. The temporary detour was put into place on June 28th, 2024 near the Idaho and Wyoming border to also restore critical access to tourist destinations such as Jackson Hole and Grand Teton National Park. The next phase of construction included the Wyoming Transmission Commission awarding a $12 million bid to Ames Construction on August 2nd. Since then, WYDOT and Ames Construction have been working 24/7 to rebuild Highway 22 and the surrounding area.

Probability of Future Events

The probability of a landslide causing damage in the Region is difficult to determine because of the poor historic data. However, WSGS mentions that landslides are one of the most common geologic hazards in Wyoming. Landslides also occur every year in Wyoming, however, most occur in remote areas and do not typically cause damage. In addition, given the analysis of topographic map quadrangles by the WSGS, along with landslide-prone location data, it is reasonable to assume that damaging events have between 10 and 100% chance of occurrence on an annual basis. Therefore, landslides, rockfalls or debris flows are likely to occur. Heavy periods of precipitation or significant development could affect slope stability. Typically, there is a landslide/rockfall 'season' that coincides with increased freeze-thaw cycles and wetter weather in the spring and early summer, as previously mentioned.

Climate Change Impacts

With climate change driving up temperatures, altering precipitation patterns, increasing the risk of wildfires, and diminishing snow caps, the likelihood of landslides is on the rise. The Fifth National Climate Assessment highlights a concerning trend: all states within the Northern Great Plains region experienced their wettest five-year period between 1995 and 2019. This pattern is indicative of broader shifts in precipitation patterns—both in terms of quantity, timing, and type—that are anticipated to unfold throughout the twenty-first century.

In Teton County, the projections indicate a significant increase in precipitation. This uptick in precipitation, particularly in the form of extreme events during both summer and winter seasons, is poised to heighten the vulnerability to landslides. Compounding this risk is the ongoing transition from snow-dominated to rain-dominated precipitation, a transition already in progress and expected to persist. The dwindling snow cover not only exacerbates the threat of landslides but also introduces additional risks, particularly concerning wildfires. In Wyoming, where wildfires are primarily ignited by lightning strikes rather than human activity, snow cover has mitigated winter wildfires. However, as snow cover diminishes, the potential for wildfires escalates, setting the stage for a cascade of secondary hazards, including landslides and debris flows. Following a wildfire, the absence of vegetation to stabilize slopes, coupled with the increased runoff resulting from burned soil surfaces, creates conditions ripe for landslide activity.

Vulnerability Assessment

PEOPLE

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways.

Similar to the methodology used in the flood section, the total people at risk were estimated by multiplying the average number of persons per household in the Town of Jackson (2.45 persons) and the County (2.33 persons) with the number of residential parcels in landslide-prone areas to estimate the population residing in landslide hazard areas. As shown in Table 4-36, there are approximately 5,257 people potentially residing in landslide susceptible areas.

Table 4-36 Teton County Population at Risk to Landslide Susceptibility Summary

JURISDICTION	STRUCTURE COUNT HIGHEST	STRUCTURE COUNT MODERATELY HIGH	STRUCTURE COUNT MODERATE	TOTAL RESIDENTIAL COUNT	POPULATION
Jackson	239	500	64	803	1,967
Unincorporated	276	1,040	96	1,412	3,290
Total	**515**	**1,540**	**160**	**2,215**	**5,257**

Source: Teton County, Wyoming CAMA 2024, Wyoming State Geological Survey, WSP GIS Analysis

BUILT ENVIRONMENT

Slope failures typically damage or destroy portions of roads, sewer and water lines, homes and public buildings, and other utility lines. Even small-scale landslides are expensive due to clean-up costs that may include debris clearance from streets, drains, streams and reservoirs; new or renewed support for road embankments and slopes; minor vehicle and building damage; personal injury; and livestock, timber, crop and fencing losses and damaged utility systems.

GIS analysis was used to estimate Region 8's potential property losses in a landslide scenario. The county parcel layers were used as the basis for the inventory of developed parcels, which was based on address points and assessor parcel data. Overlaid is landslide susceptibility data provided by Wyoming State Geological Survey. The summarized results for the Region are shown below in Table 4-37.

Table 4-37 Teton County Parcels at Risk to Landslide Susceptibility Summary

JURISDICTION	TOTAL PARCELS	STRUCTURE COUNT HIGHEST	STRUCTURE COUNT MODERATELY HIGH	STRUCTURE COUNT MODERATE	TOTAL STRUCTURE COUNT	IMPROVED VALUE	ESTIMATED CONTENT VALUE	TOTAL VALUE
Jackson	910	302	604	65	971	$1,455,495,603	$919,042,360	$2,374,537,963
Unincorporated	1,495	281	1,116	176	1,573	$5,457,088,061	$2,945,115,705	$8,402,203,766
Total	**2,405**	**583**	**1,720**	**241**	**2,544**	**$6,912,583,664**	**$3,864,158,065**	**$10,776,741,729**

Source: Teton County, Wyoming CAMA 2024, Wyoming State Geological Survey, WSP GIS Analysis

ECONOMY

Economic impacts typically center around transportation routes temporarily closed by debris flow or landslide activity. These roads may be used to transport goods across the County or provide access for tourists and local workers. Teton County's economy strongly relies on tourism, hosting popular outdoor recreation spaces such as Jackson Hole Ski Resort, Grand Teton National Park, and a substantial portion of Yellowstone National Park. Given the region's reputation for breathtaking landscapes and outdoor recreational activities such as hiking, skiing, and wildlife viewing, any disruption caused by landslides could minimize these recreation opportunities and deter tourists from visiting. Road closures, trail damage, or the perception of increased risk due to landslides might lead to decreased visitor numbers and revenue loss for businesses reliant on tourism. Road closures also close off routes to businesses and schools, reducing the ability of employees. The Big Fill landslide is an example of this, with 15% of Teton's workforce unable to get to work due to damage to Highway 22.

CRITICAL FACILITIES AND LIFELINES

To assess the potential impact of landslides on critical facilities and lifelines, a Geographic Information System (GIS) overlay was conducted using landslide susceptibility, historic hazard layers, and critical facility point data. However, due to the unavailability of replacement values within the data, a precise estimate of potential monetary loss could not be determined. Nonetheless, the consequences of damage to these facilities extend beyond mere property loss, potentially triggering cascading impacts throughout various sectors. Summary tables of the GIS analysis results are shown below. Each table includes only the facilities located within that specific hazard ranking; they are not cumulative of the categories below them.

Table 4-38 Critical Facilities at Risk to Highest Landslide Susceptibility by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	1	1	-	-	-	1	3
Unincorporated	9	1	1	1	-	2	4	3	3	24
Total	**9**	**1**	**1**	**2**	**1**	**2**	**4**	**3**	**4**	**27**

Source: Teton County, Emergency Management, Wyoming State Geological Survey, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

Table 4-39 Critical Facilities at Risk to Moderately High Landslide Susceptibility by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	1	-	1	1	2	1	-	1	7
Unincorporated	4	1	-	10	3	8	27	7	4	**64**
Total	**4**	**2**	**0**	**11**	**4**	**10**	**28**	**7**	**5**	**71**

Source: Teton County, Wyoming State Geological Survey, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

Table 4-40 Critical Facilities at Risk to Moderate Landslide Susceptibility by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	-	-	-	-	-	-	0
Unincorporated	4	1	-	1	-	1	4	1	-	12
Total	**4**	**1**	**0**	**1**	**0**	**1**	**4**	**1**	**0**	**12**

Source: Teton County, Emergency Management, Wyoming State Geological Survey, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

Table 4-41 Critical Facilities at Risk in Historic Landslide Areas by Jurisdiction

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	-	-	-	-	-	-	0
Unincorporated	2	-	-	-	-	-	4	1	-	7
Total	**2**	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**7**

Source: Teton County, Wyoming State Geological Survey, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

District specific GIS analysis did not yield risk to FCWID or Airport facilities.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

As primarily a natural process, landslides and debris flows can have varying impacts on the natural environment. Debris flows have the potential to permanently alter the natural landscape. The impacts of landslides and debris flows on historical and cultural structures would be similar to the impacts on the general property.

Land Use and Development Trends

The occurrence of landslides is highly dependent upon availability of moisture, soil saturation, and freeze/thaw cycles. Teton County and the Town of Jackson should expect to see landslide activity that is commensurate with rainfall frequency and intensity as well as snowpack condition. The same climate impacts that bring heavy snowfall to the Tetons and surrounding ranges in the planning area can also create conditions of rapid warming and snowmelt, which can increase landslide activity, especially the rockfall variety in steep terrain. Continued development and re-development, including reconstruction, road repairs and maintenance, and other uses near and along hillsides, especially in areas surrounding the Town of Jackson like Snow King Mountain, East and West Gros Ventre Buttes, and Boyles Hill, as well as areas along the base of the Tetons in the County, perpetuates the risk associated with these areas.

While there are existing vulnerabilities and exposure to landslides as discussed throughout this chapter, new development over the past 5 years has not significantly increased or altered the overall vulnerability of the County, Town of Jackson, or Teton Conservation District. The Jackson Teton County Comprehensive Plan include policies specific to landslides including policy 3.4.b avoiding development in potential landslide paths, Policy 3.4.c prohibiting new development on steep slopes, and policy 3.4.d limiting new development on poor soils susceptible to erosion. In addition, the level of disturbance required to develop on steep slopes has a disproportionate impact on natural resources. Slope development also poses difficulties for emergency access. Development on steep slopes will be avoided to the greatest extent possible. When development is not avoidable, it should employ best management practices for slope stabilization, erosion control and stormwater management. Impacts should be reduced by minimizing disturbance and adapting development to fit the topography, rather than modifying the topography to accommodate development. Hillside Land Development Regulations (LDRs) are currently being updated by the Town of Jackson with the goal of improving landslide information and establishing best practices for identifying, avoiding, and mitigating hazards in hillside development. Current regulations focus solely on slope angle and ignore soil conditions, slide history, and other factors.

Risk Summary

Landslide hazard has **medium** overall significance for Teton County. Landslides are one of the most common geologic hazards in Wyoming with a likely probability for future occurrences. While the area susceptible to landslides is primarily outside of municipalities, there is a great deal of outdoor recreation trails and roadways that exist in this overlay, making the geographic extent significant. Activities and hazards that trigger landslides tend to be wildfires, flooding, alternate freezing, seismic activity, construction, and human activity. This often leads to moderate impacts such as road closures causing long detours or clogging up drainage channels where leach-field septic systems are used.

Table 4-42 Risk Summary by Jurisdiction: Landslide

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	Medium	Impacts to transportation network are the greatest vulnerability; past events have cut off Teton County by blocking or destroying highways.
Town of Jackson	Low	Areas along the municipal boundaries of Jackson are exposed to landslide risk, which could result in direct damage to buildings and infrastructure, as well as increased risk of injuries.
Teton Conservation District	Low	Not considered to have impacts to District facilities. Landslides could cause a natural dam or increased sedimentation.
Flat Creek Watershed Association	Low	Landslides can alter or block streams and increase downstream sedimentation
Jackson Hole Airport	NA	The airport is not exposed to landslide risk

4.2.7 Severe Winter Storm

Description

The National Weather Service defines a storm as "any disturbed state of the atmosphere, especially affecting the Earth's surface, and strongly implying destructive and otherwise unpleasant weather." Winter storms, then, are storms that occur during the winter months and produce snow, ice, freezing rain, sleet, and/or cold temperatures. Winter storms are a yearly occurrence in climates where precipitation may freeze and are not always considered a disaster or hazard. Disasters occur when severe storms impact the operations of the affected community by damaging property, stalling the delivery of critical services, or causing injuries or deaths among the population.

For the purposes of this planning element, severe winter storms are those which produce heavy snow, significant ice accumulation, or prolonged blizzard conditions. The National Weather Association (NWA) Online Glossary does not define a 'severe winter storm.' However, it does define a Severe Local Storm as "A convective storm that usually covers a relatively small geographic area, or moves in a narrow path, and is sufficiently intense to threaten life and/or property." Therefore, while the term 'severe winter storm' is not an official term from the NWA, it is drawn from other official definitions and is intended to reflect these standards as much as possible while still addressing the specific needs of this Plan.

Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until damages are repaired. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can

reduce visibilities to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents can result with injuries and deaths. Extreme cold often accompanies a winter storm or is left in its wake. It is most likely to occur in the winter months of December, January, and February. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Extreme cold can disrupt or impair communications facilities. Extreme cold temperatures can destroy crops and cause utility outages, leaving people without water or power until the utility companies are able to restore service. What constitutes extremely cold temperatures varies across different areas of the United States, based on normal climate temperatures for the time of year. In Wyoming, cold temperatures are normal during the winter. When temperatures drop at least 20 degrees below normal winter lows, the cold is considered extreme and begins to impact the daily operations of the region. Extreme cold/wind chill impacts plants, animals, and water supplies. The effects of extremely cold temperatures are amplified by strong to high winds that can accompany winter storms. Wind-chill measures how wind and cold feel on exposed skin and is not a direct measurement of temperature. As wind increases, heat is carried away from the body faster, driving down the body temperature, which in turn causes the constriction of blood vessels, and increases the likelihood of severe injury or death to exposed persons. Animals are also affected by wind-chill; however, cars, buildings, and other objects are not.

Location

Winter storms are a yearly feature of the Wyoming climate and may occur anywhere in the state. Generally, severe winter storms and extreme cold events are considered regional, which implies the storms impact multiple counties or a large area simultaneously, often for extended time periods. It is possible for the geographic extent of the hazard to vary significantly within a single county - a regional storm may directly impact only a small portion of the planning area while still extending over a large portion of the surrounding area. Therefore, they are considered to have an extensive geographic impact rating.

Zones containing higher elevations (Teton and Gros Ventre Mountains & Yellowstone National Park), on average, see higher snowfall totals from the same storm system that impacts the Jackson Hole forecast zone, where smaller amounts are comparatively more typical.

Extent (Magnitude)

The damages caused by severe winter storms, blizzards and extreme cold vary and are dependent on several factors: the duration of the storm; the geographic extent; the time of year; meteorological factors such as wind, moisture content of the snow, ground, and air temperatures; and the advance warning of the storm. Impacts from the storm dictate the magnitude of the event, meaning that the amount of snow may not always directly correlate to how bad the storm is. Damaged power lines and dangerous or impassable roadways may impede the delivery of critical services such as medical and emergency assistance, the delivery of food supplies and medications, or even the provision of basic utilities such as heat and running water. When events are preceded by an extended warning time, it is possible to mitigate the effects of insufficient supply levels or to test emergency generators, which may prevent some of the previously described impacts from occurring. Unanticipated storms increase the number of people stranded, both in cars and at public locations, which may increase the number of injuries and deaths attributed to the event (often caused by exposure) and place additional strain on public sheltering capacities. The weight of the snow, driven by the water content, influences the potential for damages caused to structures and trees. Lighter snow caused by extreme cold may increase the damages to livestock, agriculture, and landscaping due to freezing conditions. Winter storms which go through periods of thaw and freeze prolong dangerous icy conditions, increasing the likelihood of frozen and damaged

water pipes, impassable or dangerous roadways, damaged communication lines, or more extensive damages to infrastructure and structures caused by seeping water freezing under roofs, porches, patios, inside sidings, or causing damage to vehicles. Extreme cold can also impact livestock and even crops if the event occurs during certain times of the year.

In addition to the variety of potential impacts discussed above, there are also several different magnitude scales useful in describing the potential range of severity of winter storm events. The National Weather Service (NWS) describes different types of snow events as the following:

- Blizzard - Winds of 35 mph or more with snow and blowing snow reducing visibility to less than ¼ mile for at least 3 hours.
- Blowing Snow - Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- Snow Squalls - Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- Snow Showers - Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- Snow Flurries - Light snow falling for short durations with little or no accumulation.

Winter storm watches and warnings issued by the National Weather Service (NWS) may also be helpful for determining the difference between a seasonal winter storm and a severe winter storm. Warnings are issued if the storm is producing or suspected of producing heavy snow or significant ice accumulations. Watches are usually issued 24 to 36 hours in advance for storms capable of producing those conditions, though criteria may vary between locations. Winter Weather Advisories are issued when a low-pressure system produces a combination of winter weather that presents a hazard but does not meet warning criteria. Descriptions of various NWS winter weather alerts are provided in Table 4-43.

Table 4-43 NWS Winter Weather Alert Categories

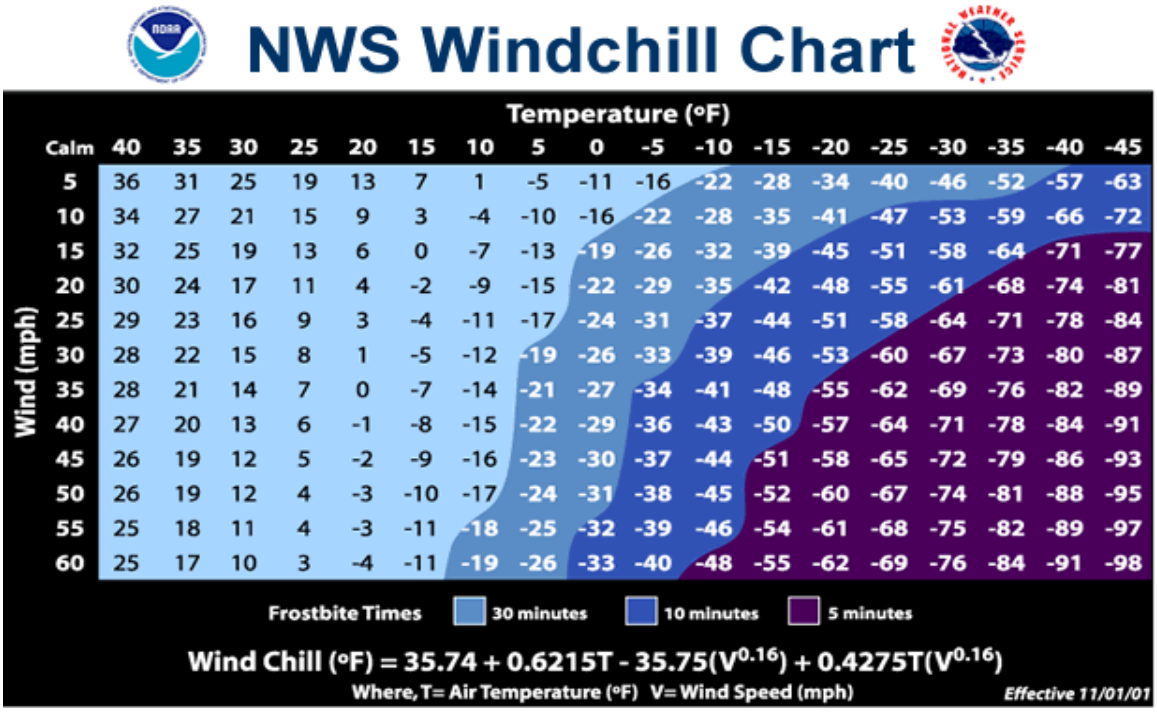
ALERT NAME	ALERT DESCRIPTION
Winter Weather Advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter Storm Watch	Severe winter weather conditions may affect your area (freezing rain, sleet or heavy snow may occur separately or in combination)
Winter Storm Warning	Severe winter weather conditions are occurring or imminent.
Freezing rain or freezing drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard Warning	Sustained wind speeds of at least 35 mph with visibility reduced to ¼ mile or less, for at least 3 hours accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted
Snow Squall Warning	Quick, intense bursts of snow, accompanied by strong gusty winds. Expected rapid reduction of visibility, these are typically issued as smaller polygons, like tornado warnings, along transportation corridors. They are short-fuse products that typically last 30 to 60 minutes.
Frost/Freeze Warning	Below freezing temperatures are expected and may cause significant damage to plants, crops and fruit trees.

ALERT NAME	ALERT DESCRIPTION
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind - chill factor.

Source: National Weather Service

In 2001, the NWS implemented an updated Wind-Chill Temperature index. This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 4-26 National Weather Service Wind-Chill Chart



Source: NOAA

Previous Occurrences

For a record of previous occurrences, the NOAA National Centers for Environmental Information (NCEI) database was used. NCEI data on winter storms and extreme cold events in Region 8 extends from January 1996 through October 2023. During that time, Region 8 experienced 459 winter weather incidents, including blizzards, extreme cold/wind chill, heavy snow, winter storms, and winter weather. It is important to note that this database is comprised of information that is reported to NOAA, so the records are likely incomplete regarding the total number of events as only those with measurable impacts typically get reported. Table 4-44 includes a breakdown of the reported events. The Region experiences an average of 17 winter weather incidents annually. There have been no reported fatalities associated with these incidents, and one reported injury. (Many minor injuries from winter weather likely go unreported.) Total reported property damages in the Region amounted to $1,100,000, the majority of which occurred in a single storm on October 15, 1998.

Table 4-44 Winter Weather Events Summary, 1996-2023

EVENT TYPE	NUMBER OF EVENTS	FATALITIES/ INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Blizzard	2	0 / 0	$0	$0
Extreme Cold/ Wind Chill	15	0 / 0	$0	$0
Heavy Snow	84	0 / 0	$0	$0
Winter Storm	354	0 / 1	$1,100,000	$0
Winter Weather	4	0 / 0	$0	$0
Total	**459**	**0 / 1**	**$1,100,000**	**$0**

Source: NCEI

As shown in Table 4-45 above, Teton County falls into 3 different NWS forecast zones. The NWS has issued 482 Advisories, Watches, and/or Warnings concerning winter weather phenomena specifically for the Jackson Hole forecast zone between 2005 and March 2024, as shown in Table 4-45 which also includes information from the Teton & Gros Ventre Mountains and Yellowstone National Park forecast zones.

Table 4-45 Winter Weather Watches, Warnings, and Advisories for Teton County, 2005 – March 2024

	JACKSON HOLE ZONE	TETON & GROS VENTRE ZONE	YELLOWSTONE NP ZONE
Blizzard Warning	1	0	0
Freeze Warning	27	0	0
Freeze Watch	9	0	0
Snow Advisory	41	59	58
Wind Chill Advisory	2	2	1
Wind Chill Warning	3	3	3
Winter Storm Warning	109	169	96
Winter Storm Watch	95	146	111
Winter Weather Advisory	195	300	259
Total	**482**	**679**	**528**

Source: Iowa State University Environmental Mesonet Database (https://mesonet.agron.iastate.edu/vtec/search.php#byugc)

The winter of 2018-2019 was one of the snowiest on record for the Jackson area. Prior to February 2019, the snowiest February on record was 1978, when 33 inches were recorded that month. By February 21, 2019, Jackson had received 41.5 inches of snow for the month, easily surpassing the previous record from 1978. By the end of the month, February 2019 would go down as the second snowiest month ever recorded for Jackson, totaling 51.8 inches. The record stands at 56 inches recorded for January of 1969.

The winter season of 2022-2023 also saw much heavier snowfalls and colder than average temperatures throughout Teton County and the Jackson Hole Valley. According to data from Bridger-Teton National Forest, total snowfall for the season recorded on in the Rocky Mountains within Grand Teton National Park from October 1, 2022 to April 1, 2023 was 572 inches, which was only four inches shy of the record seasonal snowfall set during the winter of

1996-1997. Snowfall and accumulated snow depths are typically much lower in the Town of Jackson and areas of the Jackson Hole Valley.

(https://www.mountainweather.com/2023/04/jacksons-cold-and-snowy-winter-of-2022-23/#:~:text=In%20the%20bigger%20picture%2C%20the,snowfall%20during%20that%20same%20period.)

Probability of Future Events

Winter storms and extreme cold are an annual occurrence in Wyoming, often occurring multiple times each winter, and affecting entire regions in their size and scope. Since 1996, Teton County has averaged 17 recorded severe winter weather events per year according to the NCEI database. Additionally, as shown in Table 4-45 based on the number of NWS winter weather watches and warnings, the number of issuances varies depending on the forecast zone and phenomena; however this provides an average of between 25 and 36 issuances per year across the county, further indicating how this hazard is all but guaranteed to occur multiple times per year in the future.

It is important to note that the lack of specific historical accounts on extreme cold temperatures does not necessarily indicate a low frequency of occurrence. Residents of Wyoming are used to cold weather and may be less likely to report events that might be considered extreme in other areas.

Climate Change Impacts

One possible outcome of a warming climate are warmer winters, the benefits of which may include lower winter heating demand, less cold stress on humans and animals, and a longer growing season. According to the Fifth National Climate Assessment, increasing average temperatures have occurred across all seasons, but are most pronounced in winter for the Northern Great Plains region (which includes Wyoming). Climate models from the University of Wyoming predict warmer temperatures in the winter months. This could lead to more precipitation and a greater intensity of storms.

Protect Our Winters, a 501(c)(3) nonprofit, identified a strong positive relationship between skier visits and snow cover and/or snow water equivalent. During high snow years, their analysis showed increased participation levels in snow sports resulting in more jobs and added economic value. In low-snow years, participation drops, resulting in lost jobs and reduced revenue. The effects of low snow years impact the economy more dramatically than those of high snow years.

Vulnerability Assessment

PEOPLE

Winter storms in the Region, including strong winds and blizzard conditions, may cause localized power and phone outages, closures of streets, highways, schools, businesses, and non-essential government operations, and increase the likelihood of winter-weather related injury or death. People may be stranded in vehicles or other locations not suited to sheltering operations or isolated from essential services. A winter storm can escalate, creating life threatening situations when emergency response is limited by severe winter conditions. Other issues associated with severe winter storms include the threat of physical overexertion that may lead to heart attacks or strokes. Snow removal costs can pose significant budget impacts, as can repairing the associated damages caused by downed power lines, trees, structural damages, etc. Heavy snowfall during winter can also lead to flooding or landslides during the spring if the area snowpack melts too quickly.

Extreme cold/wind chill pose the greatest danger to outdoor laborers, such as highway crews, police and fire personnel, and construction. The elderly, children, people in poor physical

health, and the homeless are also vulnerable to exposure. Overall, the population has a medium exposure to severe cold.

Severe winter weather also increases the vulnerability of the commuting population. While there is no way to quantify which of these accidents occur during severe winter storms versus regular winter storms, the numbers indicate that winter driving conditions raise the vulnerability of the commuting population.

BUILT ENVIRONMENT

The built environments vulnerability to severe winter weather includes physical damage caused by high winds, ice, or snowpack and melting snow. Vehicles may be damaged as well or left temporarily unusable due to the driving conditions created by severe winter weather. Contents of homes, storage units, warehouses and storefronts may be damaged if the structures are compromised or fail due to excessive snow loading. Very wet snowpacks down densely and is very heavy. This may cause strain on structures, leading to partial or entire collapses of walls, roofs, or windows in extreme cases. Crops, livestock, and other agricultural operations are also vulnerable to severe winter storms.

Extreme cold/wind chill presents a minimal risk to structures; however, it is common for damage to occur when water pipes freeze and break. Homes without adequate insulation or heating may put owners at a higher risk for damages or cold-related injury. Vehicles may not start or may stall once started due to the cold temperatures and the risks of carbon monoxide poisoning or structure fires increases as individuals attempt to warm cars in garages and use space heaters. Driving conditions may deteriorate if extreme cold/wind chill prolongs icy road conditions, which will impact commutes and emergency response times as well. Landscaping and agricultural products may be damaged or destroyed by unseasonable occurrences of extreme cold/wind chill, causing plants to freeze and die. This may increase the indirect vulnerabilities to severe cold by causing greater economic costs and losses for the year. The overall vulnerability of general property is low.

ECONOMY

The regional economy in the winter is dependent on winter storms to bring snow to the ski areas and visitors to enjoy the recreational opportunities that are common in the winter. Economic impacts can result when road closures block travel and transportation of goods into the region, however these are usually temporary.

CRITICAL FACILITIES AND LIFELINES

Ice or heavy accumulations of snow, particularly with blowing and drifting, can significantly impact roadways and commuters that use them. Storms and storm warnings also require vast amounts of overtime for County and local highway and streets departments to remove snow and melt ice. Further, as is described in the avalanche hazard section, many commuters to and from the Jackson Hole area rely on high mountain passes or steep canyons for commuter travel. Highway 22 over Teton Pass from Idaho to Wyoming is the most heavily traveled of these routes, as the local workforce has access to more affordable home prices in areas like Victor and Driggs, ID. Responding to the effects of a winter storm is made difficult for certain county services due to development in remote or hard-to-access locations. Grand Targhee Resort and the Alta area of Teton County are especially difficult for emergency service access, as getting there requires a 45-mile drive over Teton Pass, north through Idaho, and back into Wyoming via Ski Hill Rd.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

Natural resources may be damaged by the severe winter weather, including broken trees and death of unsheltered wildlife. Unseasonable storms may damage or kill plant and wildlife,

which may impact natural food chains until the next growing season. Historical areas may be more vulnerable to severe winter storms due to construction and age of structures. Cultural resources generally experience the same vulnerabilities outlined in General Property, in addition to lost revenue impacts due to transportation impacts. The overall vulnerability of these resources is medium.

Land Use and Development Trends

The county has experienced a notable increase in residential development as individuals are drawn to the scenic and recreational opportunities the area offers. As areas are being developed the County Building Codes Resolution of Teton County requires in sections 35-9-101 through 35-9-121 that structural supports of roofs must be designed to resist wind, snow, and earthquake loads. Additionally, the county requires that any new buildings being constructed should have an ice and water shield on the roof, which is an underlayment designed to be installed underneath a shingle, tile, or metal roof. This is not required by code in many other counties but due to the amount of winter storms in the region every year, Teton County requires it. Measures such as this have ensured that risk and vulnerability to winter storms has not been increased significantly for the County, Town of Jackson, or Teton Conservation District due to growth over the last 5 years.

Additionally, there has been a strong effort and focus to balance development with environmental conservation, resulting in stringent land use regulations aimed at preserving the county's natural resources and wildlife habitats. The ongoing challenge for Teton County is to manage growth sustainably while maintaining the delicate balance between development and conservation.

Risk Summary

While winter storms are characteristic of the planning area, in general, Teton County, the Town of Jackson, and residents have adapted to the consequences of this hazard, and impacts are less severe than they would be in other planning areas where winter storms are less common.

Table 4-46 Risk Summary by Jurisdiction: Severe Winter Storm

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	Medium	Winter storms typically affect a large area, with potential for localized variations in the severity. Vulnerability and impacts generally do not vary between jurisdictions. Structural damage, power outages, and transportation disruptions are all common impacts.
Town of Jackson	Medium	Vulnerability and impacts generally do not vary between jurisdictions. Structural damage, power outages, and transportation disruptions are all common impacts.
Teton Conservation District	Medium	Vulnerability and impacts generally do not vary between jurisdictions. Structural damage, power outages, and transportation disruptions are all common impacts.
Flat Creek Watershed Association	Medium	Frazil ice could cause the overflow of certain areas within the watershed and damage property. Additionally, power outages and transportation disruptions are also common impacts of winter storms in this area.
Jackson Hole Airport	Medium	Winter storms can often cause delays and sometimes temporarily ground flights. Even if the airport remains open, closures of North Highway 89 can prevent travelers from getting to or leaving the

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
		airport and also prevent delivery of critical supplies to the airport, including fuel.

4.2.8 High Winds (Including Tornado)

Description

High Winds

High winds/windstorms, the most prevalent form of severe weather, often accompany severe thunderstorms, known as convective windstorms. These events pose significant risks, including property and crop damage, threats to public safety, and disruptions to utilities and communications. Straight-line winds, which are lacking rotation, can occasionally surpass speeds of 100 miles per hour (mph). The National Weather Service (NWS) defines high winds as sustained speeds of 40 mph or greater lasting for at least an hour, or speeds exceeding 58 mph regardless of duration.

The NCEI database categorizes wind events into three categories: high winds, strong winds, and thunderstorm winds. The key divergence between high winds and thunderstorm winds in the National Centers for Environmental Information (NCEI) dataset lies in their timing and reporting scale. High winds are most frequently reported in winter months (December, January, and February) and are recorded on a zonal scale, whereas thunderstorm winds are most reported in the summer months (June, July, and August) and recorded on a local county or city scale. Strong winds on the other hand originate from thunderstorms and can range from 32 to 73 mph. Strong winds are the least frequently documented category of wind in Teton County. Despite these differences, the winds speeds and associated impacts from these winds are comparable.

Wind speed is also rated on the Beaufort wind scale (Table 4-47). The Beaufort wind scale is particularly useful for estimating wind speed in the absence of instrumentation. This HMP update uses the aforementioned NCEI wind speed classifications and data to evaluate wind hazard extent.

Table 4-47 Beaufort Wind Scale

FORCE	SPEED (MPH)	DESCRIPTION
0	0-1	Calm
1	1-3	Light Air
2	4-7	Light Breeze
3	8-12	Gentle Breeze
4	13-18	Moderate Breeze
5	19-24	Fresh Breeze
6	25-31	Strong Breeze
7	32-38	Near Gale
8	39-46	Gale
9	47-54	Severe Gale
10	55-63	Storm

Source: NWS

Tornadoes

Tornadoes are one of the destructive types of severe weather. Tornadoes are violently rotating columns of air, formed by a combination of atmospheric instability and wind shear. Instability occurs when warm, moist air is wedged under drier, cooler air aloft. This warm air rises, causing the intense updrafts and downdrafts seen in strong thunderstorms — the incubators of tornadoes. Wind shear refers to changes in wind direction and speed at different elevations in the atmosphere. The combination of instability and wind shear forms the rotating column of air that we associate with a tornado. Tornadoes that form over water are known as waterspouts. Tornadoes that do not reach the ground surface are simply referred to as funnel clouds.

Until 2006, tornadoes were categorized by the Fujita Scale based on the tornado's wind speed. The Enhanced Fujita (EF) Scale was implemented in place of the Fujita Scale and began operational use on February 1, 2007. A comparison of the Fujita and EF scales and wind speeds is summarized in Table 4-48 The EF-scale has six categories from zero to five representing increasing degrees of damage. It was revised to better align wind speeds closely with associated storm damage. It also adds more types of structures as well as vegetation, expands degrees of damage, and better accounts for variables such as differences in construction quality. The EF-scale is a set of wind estimates based on damage. It uses three-second estimated gusts at the point of damage. These estimates vary with height and exposure. Forensic meteorologists use 28 damage indicators and up to 9 degrees of damage to assign estimated speeds to the wind gusts. Table 4-48 describes the EF-scale ratings versus the previous Fujita Scale used prior to 2007 (NOAA 2007).

Table 4-48 The Fujita Scale and Enhanced Fujita Scale

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

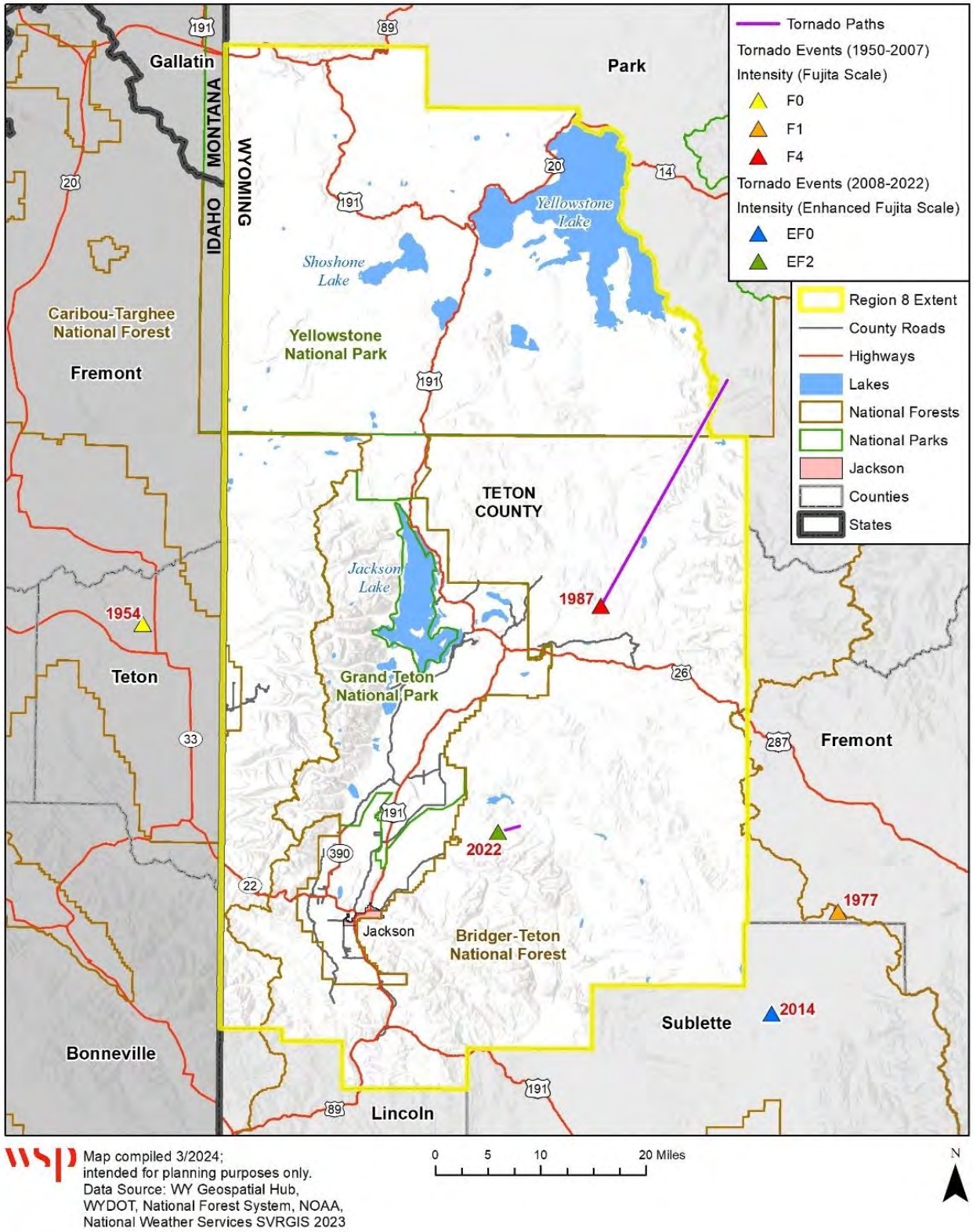
Notes:
EF = Enhanced Fujita; F = Fujita; mph = Miles per Hour

Location

Teton County is susceptible to tornadoes, as well as the entire State of Wyoming. While some areas may have seen more tornadoes than others, this is more of a statistical anomaly than a casual result. Like other hazard events, greatest losses are likely to be in cities, where there is a

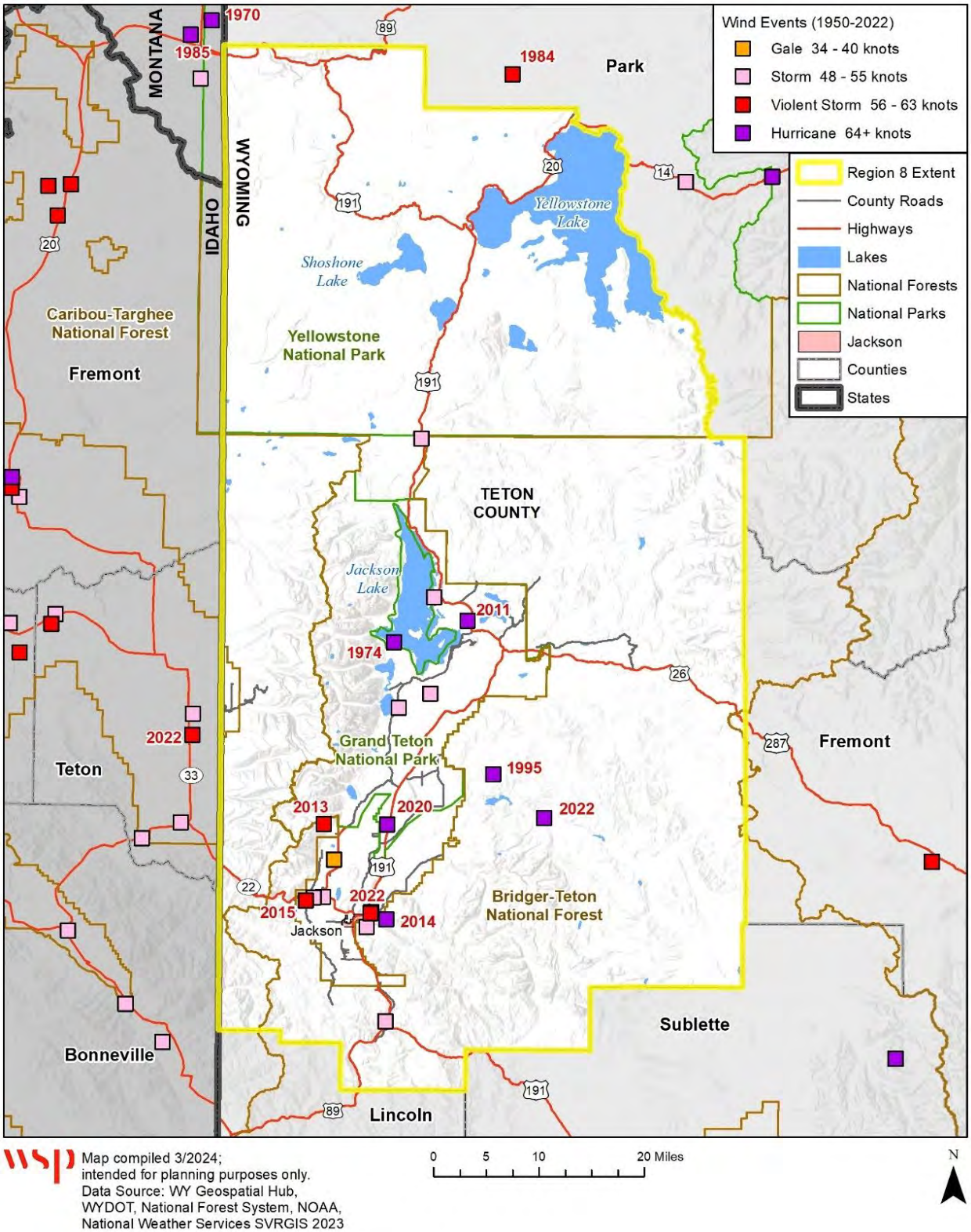
greater concentration of infrastructure. Figure 4-27 through Figure 4-28 displays the location of historic tornado and wind events in Teton County from 1950-2022.

Figure 4-27 Teton County Tornado Events 1950-2022



Map compiled 3/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, National Forest System, NOAA,
National Weather Services SVRGIS 2023

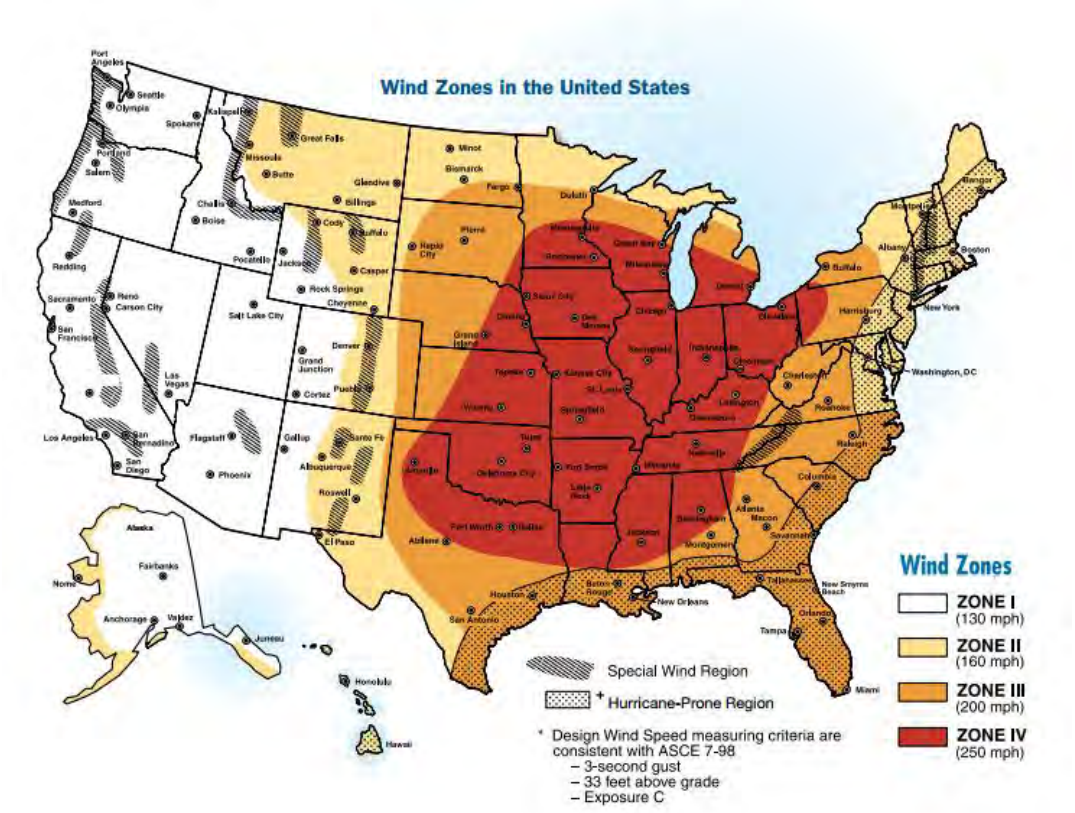
Figure 4-28 Teton County Wind Events 1950-2022



Extent (Magnitude)

The National Weather Service considers tornadoes to be among nature's most violent storms. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Tornadic winds can cause people and autos to become airborne, rip ordinary homes to shreds, and turn broken glass and other debris into lethal missiles. Even weaker tornados can cause large economic damages. The wind zone map shown below indicates the potential magnitude of wind speeds. Teton County is located in Zone I, which can expect winds up to 130 mph. While F4 tornadoes have been the strongest recorded in the Region, it is possible stronger tornadoes could occur.

Figure 4-29 Wind Zones in the United States



Source: FEMA

Though the strength of the tornado often dictates the impacts, it is important to remember that the location (rural or urban) of the tornado is just as important when assessing these risks, and location is a random factor. Impacts can vary depending on multiple factors, including the size and strength of a tornado, and its path.

Previous Occurrences

The NCEI database was used to gather information on tornadoes and severe windstorms in Teton County. The NCEI data is a comprehensive list of oceanic, atmospheric, and geophysical data across the United States and aggregated by county and zone. The NCEI uses unique methods of recording various hazards.

The NCEI database reported 68 windstorm events and 2 tornado events since 1970. A summary of these events is captured in Table 4-49 In total, over $3.5 million was lost in property

damages and $0 lost in crop damages. No fatalities have occurred due to severe windstorms and tornadoes, although there were 4 injuries reported in the County. It is important to note that due to the nature of NCEI data, losses from unreported events are not included in the dataset and some losses may be duplicated between jurisdictions, therefore, the real losses from severe windstorms and tornadoes are likely different than what is displayed in the table below, but estimates are useful for planning purposes.

Table 4-49 Summary of Losses by Hazard in Teton County, 1970-2023

	DEATHS	INJURIES	PROPERTY LOSS	CROP LOSS	DAYS WITH EVENTS	TOTAL EVENTS
High Wind	0	3	$554,000	$0	13	17
Strong Wind	0	0	$0	$0	0	0
Thunderstorm Wind	0	1	$487,000	$0	43	51
Tornadoes	0	0	$2,500,000	$0	2	2
Total	**0**	**4**	**$3,541,000**	**$0**	**58**	**70**

Source: NCEI, Table by WSP

The NCEI reported details on significant events in Teton County:

- **July 21, 1987**: Teton County experienced the strongest tornado ever recorded in the State of Wyoming. Based off the Fujita Scale, the tornado was estimated to be an F4/EF4. While it has since been surpassed by several others, at the time this was the highest elevation tornado known in the United States. Over 1,000,000 trees were knocked down as the tornado tracked through altitudes up to 10,000 feet with wind speeds of 207 to 260 mph. The tornado event caused $2,500,000 in damages, due to the blown down timber.
- **August 5, 1996**: A high wind event took place in Yellowstone Nation Park causing $54,000 in property loss. Wind gusts in the County reached approximately 82 mph.
- **March 16, 1999**: A high wind event occurred in the county with wind gusts reaching 84 mph. There was a significant amount damage to property and trees throughout the county, causing approximately $500,000 in property damages.
- **February 9, 2017**: In February of 2017 the region experienced a winter storm that cut power to many homes, primarily due to wind damages throughout the County. A State of Emergency was declared for the Teton Village Area of Jackson Hole. The storm downed 17 transmission poles/towers resulting in the loss of power for residents served by Lower Valley Energy. Wind and flooding from this storm caused approximately $2.42 million in damage, resulting in a Federal Disaster Declaration under the Stafford Act. The county received FEMA Public Assistance funding to support. Lower Valley Energy was able to use funds from the Hazard Mitigation Program during their cleanup effort. This event was classified by FEMA as a severe storm and information is not included in the table above, which only includes data from NCEI.
- **July 24, 2023**: A thunderstorm occurred at the Sweetwater County airport, shortly moving into Teton County. There was a wind gust that was reported to reach 61 mph at the Jackson Hole Airport, that caused power outages in Wilson. There was approximately $250,000 in property damages.

Probability of Future Events

According to the NCEI dataset, there has been 70 total recorded severe windstorm and tornado events over the past 53 years in Teton County since 1970. The probability of future

occurrences would be rated as **likely**. Tornado is the least documented type of windstorm in Teton County and thunderstorm winds are the most common. In the county, there has been only two recorded tornados. As mentioned previously, the tornado that occurred in 2017 caused approximately $2,800,000 in damages and the closure of popular sites such as Grand Teton National Park.

Climate Change Impacts

For some types of extreme weather events, such as tornadoes and severe thunderstorms, more research is also needed to understand how climate change will affect them. These events occur over much smaller scales, which makes observations and modeling more challenging. Projecting the future influence of climate change on these events can also be complicated by the fact that some of the risk factors for these events may increase with climate change, while others may decrease, like the complexity of predicting future wind patterns.

Vulnerability Assessment

Due to the rural makeup, the county has historically experienced minimal impact on people and property during tornado incidents. The F-scale ratings assigned to historical tornadoes in the region are relatively low, largely due to limited recorded damage. However, if these tornadoes had struck one of the numerous communities in the region instead of timberland, remote areas, and farmland, the recorded damage could be significantly more severe. Tornadoes strike randomly across the county, making all structures, critical facilities, essential services, and populations vulnerable to their unpredictable paths.

PEOPLE

The entire planning area is at risk of windstorms and tornadoes, with certain areas being more exposed due to their geographic positioning and local weather patterns. Populations residing at higher elevations, surrounded by extensive tree cover and power lines, may face heightened vulnerability to wind damage and power outages. Although tornadoes typically form in flat plains where conditions are optimal, they have been known to cross rivers and traverse mountainous terrain.

Vulnerable populations encompass the elderly, low-income individuals, linguistically isolated communities, those with life threatening illnesses, and residents dwelling in areas isolated from major road networks. Severe wind or tornado-induced power outages can pose life-threatening situations for individuals reliant on electricity for medical equipment. These groups may endure isolation and increased exposure during thunderstorm wind, high wind, and tornado occurrences, potentially suffering from secondary effects of the hazards.

Individuals caught in the path of a tornado without access to suitable shelter face heightened vulnerability. This includes the outdoors, in vehicles, or lacking access to basements, cellars, or designated safe rooms. Hikers and climbers in the region may also be more susceptible to severe weather events. Visitors to the area might not be fully aware of how swiftly thunderstorms can develop in mountainous regions.

BUILT ENVIRONMENT

All properties are potentially exposed to damage during thunderstorms and high winds, with those in poor condition or situated in particularly vulnerable areas facing the greatest risk. While damage is often minimal and goes unreported, properties located at higher elevations or on ridges may be more susceptible to wind damage. Additionally, properties situated beneath or near overhead lines or large trees are at risk of damage in the event of a collapse.

Similar to severe winds, buildings are potentially exposed, and some are more susceptible to tornadoes. Older buildings in the area may have been constructed to lower code standards or none at all, rendering them more vulnerable to severe wind and tornado events. Mobile homes are disproportionately at risk due to their design, and tornadoes frequently generate flying

debris that can cause damage to homes, vehicles, and the landscape. In Teton County, property damages resulting from wind and tornadoes exceeded $3.5 million. Reported impacts of high winds in the planning area include damage to trees, mobile homes, roofs, power lines, and vehicles.

ECONOMY

Tornado and windstorm events can cause significant damages to commercial and private structures. Debris from these hazard events would need to be collected and properly disposed of. Such an event would likely have sustainably negative effects on the local economy, such as tourism. Businesses throughout the county can also face disruptions in operations due to damages to facilities. This can also lead to infrastructure repair. Teton County has had approximately $3,541,000 in property damages from wind and tornadoes since 1970, with the most recent 2017 storm causing $2,800,000 in damage. Many local businesses also lost income due to closing for several days during peak season.

CRITICAL FACILITIES AND LIFELINES

The primary transportation disruptions resulting from windstorms and tornadoes typically involve road closures and loss of access. These events can inflict significant damage to trees and power lines, leading to the obstruction of roads with debris, hindering transportation, isolating communities, and disrupting both inbound and outbound travel. Of particular concern are roads that provide access to remote areas and vulnerable populations such as the elderly.

Among the most common challenges associated with these weather events is the loss of utilities. Downed power lines can trigger widespread blackouts, effectively isolating large areas, a scenario documented numerous times in the National Centers for Environmental Information (NCEI) dataset. Furthermore, disruptions to phone, water, and sewer systems may occur. The loss of electricity and phone connectivity could leave certain populations stranded, as residents would be unable to request assistance.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

Tornadoes and windstorms pose a risk to the environment, natural, and cultural resources throughout the County. Trees are particularly vulnerable to wind damage during tornadoes, with broken branches and limbs becoming airborne debris that can cause property damage. According to NOAA, Wyoming is the windiest state in the country. With little variety in elevation and lack of vegetation, the southern half of the state has experienced the highest wind speeds. However Teton and neighboring Fremont County have had a jet stream produce over 100 mph winds from Idaho. Throughout the county and state historic buildings constructed before modern building codes are also more susceptible to tornado/windstorm hazards.

Land Use and Development Trends

While significant growth and development in Teton County have occurred since the last plan update, which has increased exposure of critical facilities and property to the impacts of high winds, it has not significantly altered the vulnerability to this hazard for the County, Town of Jackson, or Teton Conservation District. The prevalence of open space and sporadic development throughout Teton County generally lowers the risk to damage to existing development from tornadoes, while tornado occurrence remains possible. High winds are more likely to cause damage as they impact a larger area at once than tornadoes do.. The ability to withstand impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. Development regulations that require safe rooms, basements, or other structures that reduce risk to people would decrease vulnerability but may not be cost-effective given the relative infrequency of damaging tornadoes in Teton County.

Risk Summary

- Severe windstorms (high wind and thunderstorm wind) and tornado events are rated as Low overall significance for Teton County.
- These events can impact anywhere in the planning region; therefore, the hazard extent is rated as Significant.
- The NCEI data reported 70 events with severe weather since 1970. Therefore, the future occurrence is rated as Likely.
- The NCEI reported no deaths, 4 injuries, and $3,541,000 million in property damages there the magnitude is rated Limited.
- Related Hazards: Wildfire, Severe Summer Weather, Severe Winter Weather, Transportation Accidents

Table 4-50 Risk Summary by Jurisdiction: High Winds

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	Medium	People who are dependent on electricity and populations who work outdoors or in transportation are most vulnerable to severe windstorm events and tornadoes. Individuals living in mobile homes are also disproportionately likely to experience losses from wind and tornado events.
Town of Jackson	Low	Power outages and damage to buildings are frequently reported impacts to property of severe windstorm events and tornadoes. Significant economic losses are possible in the event of a severe windstorm or tornado due to infrastructure repair and business/service disruptions.
Teton Conservation District	Low	Damages to trees from windstorms are the greatest impacts.
Flat Creek Watershed Association	N/A	No impacts.
Jackson Hole Airport	Low	High winds can potentially cause delays and sometimes temporarily ground flights. Microbursts can affect takeoff of an aircraft by reducing lift, increasing drag, and decreasing engine thrust. Microburst mitigation is important especially with high wind speeds in Wyoming.

4.2.9 Wildfire

Description

A wildfire is characterized as a highly destructive fire or any instance of uncontrolled burning in grasslands, brush, or woodlands. The encroachment of wildfires into urban areas is on the rise, driven by population growth near forested settings. According to the National Interagency Fire Center (NIFC), a “wildland fire” refers to any non-structure fire occurring in natural terrain excluding prescribed fires. The term “wildland/urban interface” (WUI) is commonly used in

wildfire management to describe areas where the man-made structures are built near or within natural terrain, posing a high risk of wildland fires.

The direction a slope faces known as “aspect”, and the arrangement of vegetation on hillsides significantly influence wildfire susceptibility. High temperatures, low humidity, wind, and lightning are key weather components affecting wildfire potential. Drought conditions exacerbate the risk by drying out fuels, making them more prone to ignition and intense burning. Wind, particularly influential, can accelerate fire spread regardless of temperature and humidity.

As Wyoming’s population and wildland/urban interface expand, the wildfire risk escalates. Decades of fire suppression have led to dense vegetation growth, increasing the potential fuel load for wildfires. The growth of densely populated forests within the wildland/urban interface amplifies the threat of catastrophic wildfires. While wildfires historically played a natural role in Western landscapes, their effects vary depending on the resources at risk. While some species thrive following fire, others face negative impacts, highlighting the complex relationship between wildfires and their ecosystems.

Location

Over the last 25 years, Teton County and Town of Jackson have endured notable wildfire seasons. While fire is a natural phenomenon vital for ecosystem health in many vegetation types in this area, its impact on private and crucial community infrastructure can be severe. Teton County can have dry, hot summers that make it easier for wildfire ignition with the blend of forests, grasslands, and sagebrush. Over time, the county has experienced wildfires of different sizes and intensities. Figure 4-30 and Figure 4-31 shows the areas at greatest risks of wildfire, based on WYWRAP (Wyoming Wildfire Risk Assessment Portal) data, in Teton County and Town of Jackson, and Figure 4-32 and Figure 4-33 show the risk for FCWID and the Jackson Hole Airport District, respectively. While the threat of wildfire is statewide and regionwide, the greatest risk to people and property is concentrated near inhabited areas.

Figure 4-30 Teton County Wildfire Risk

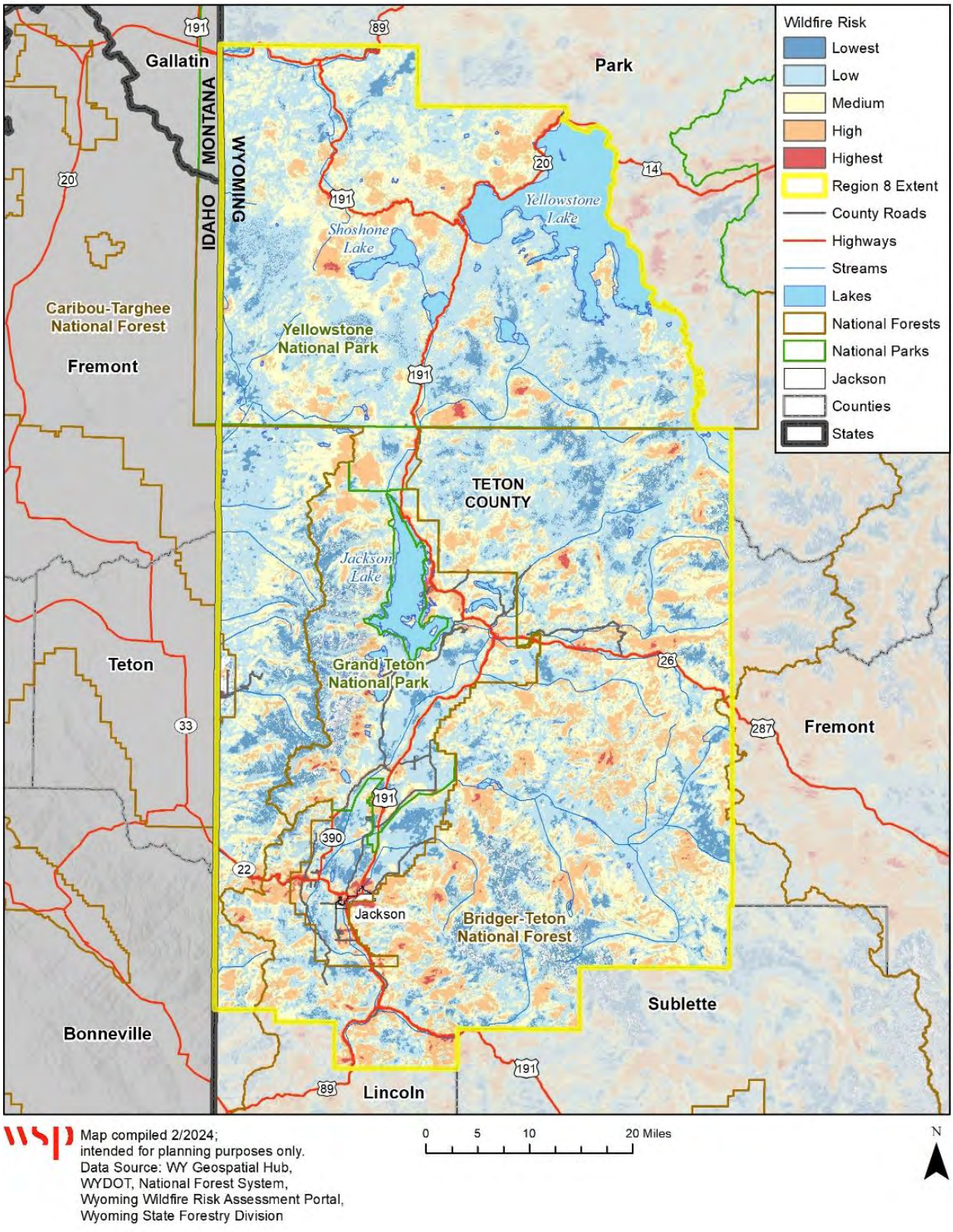
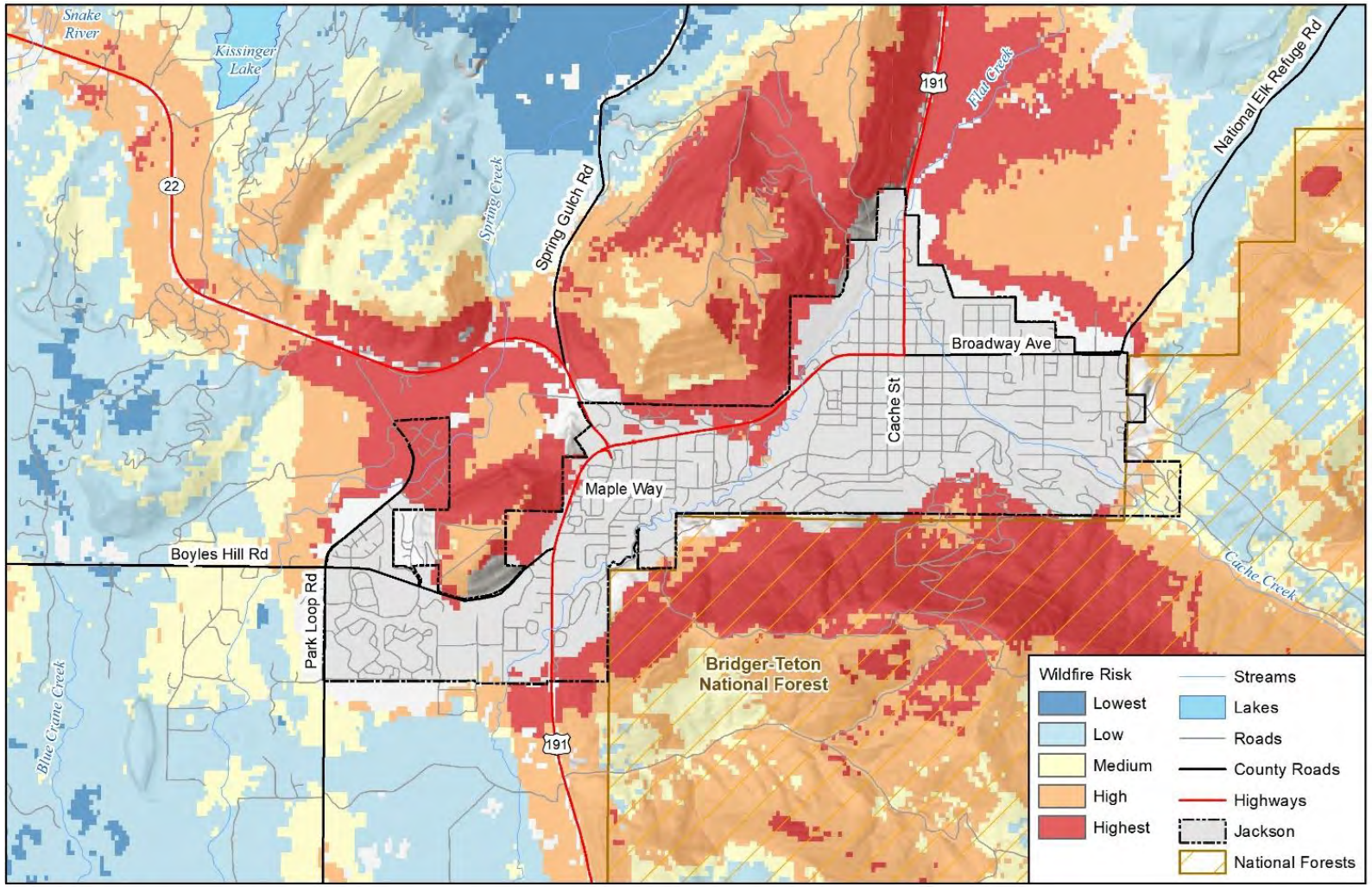
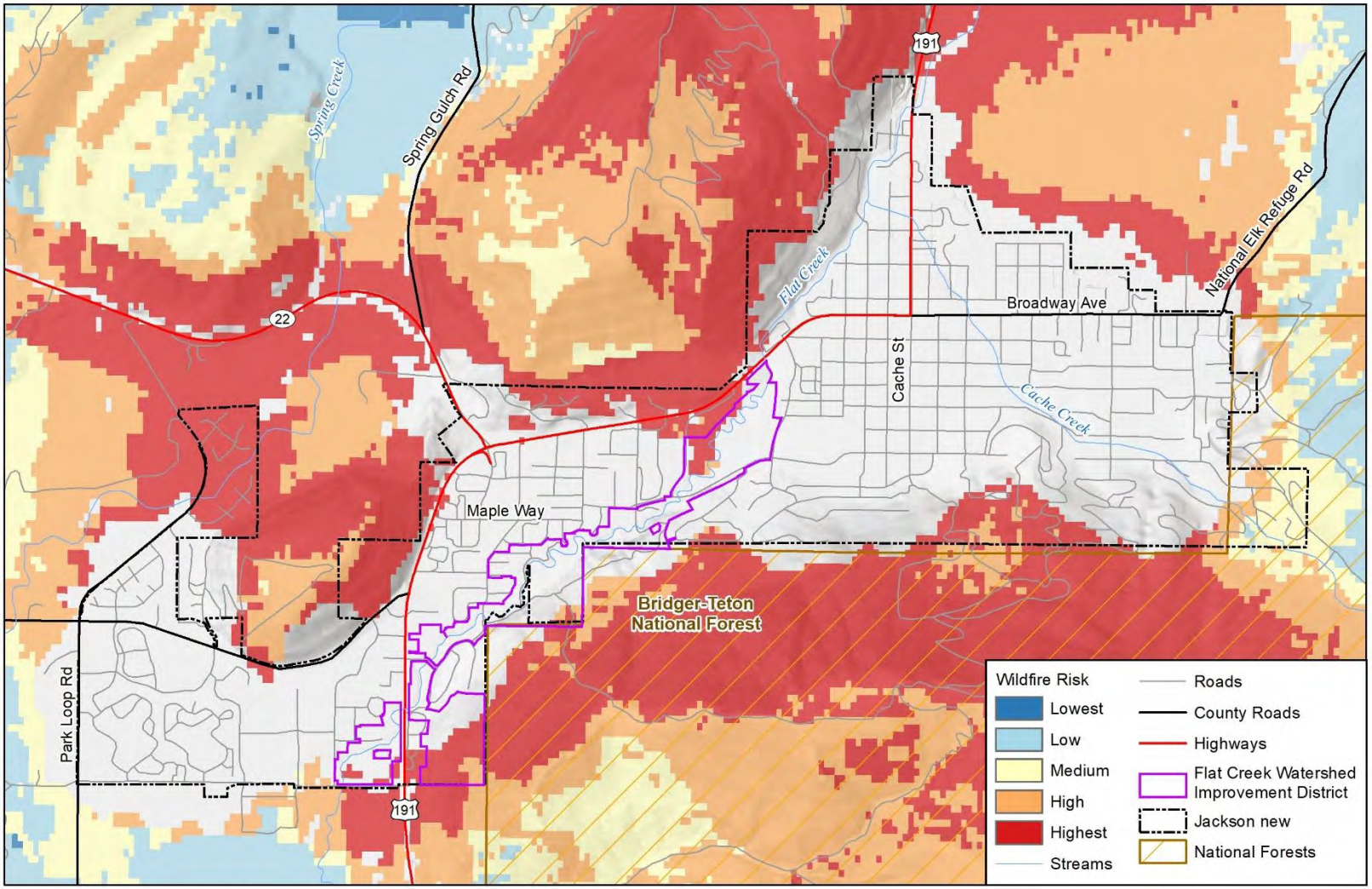


Figure 4-31 Town of Jackson Wildfire Risk



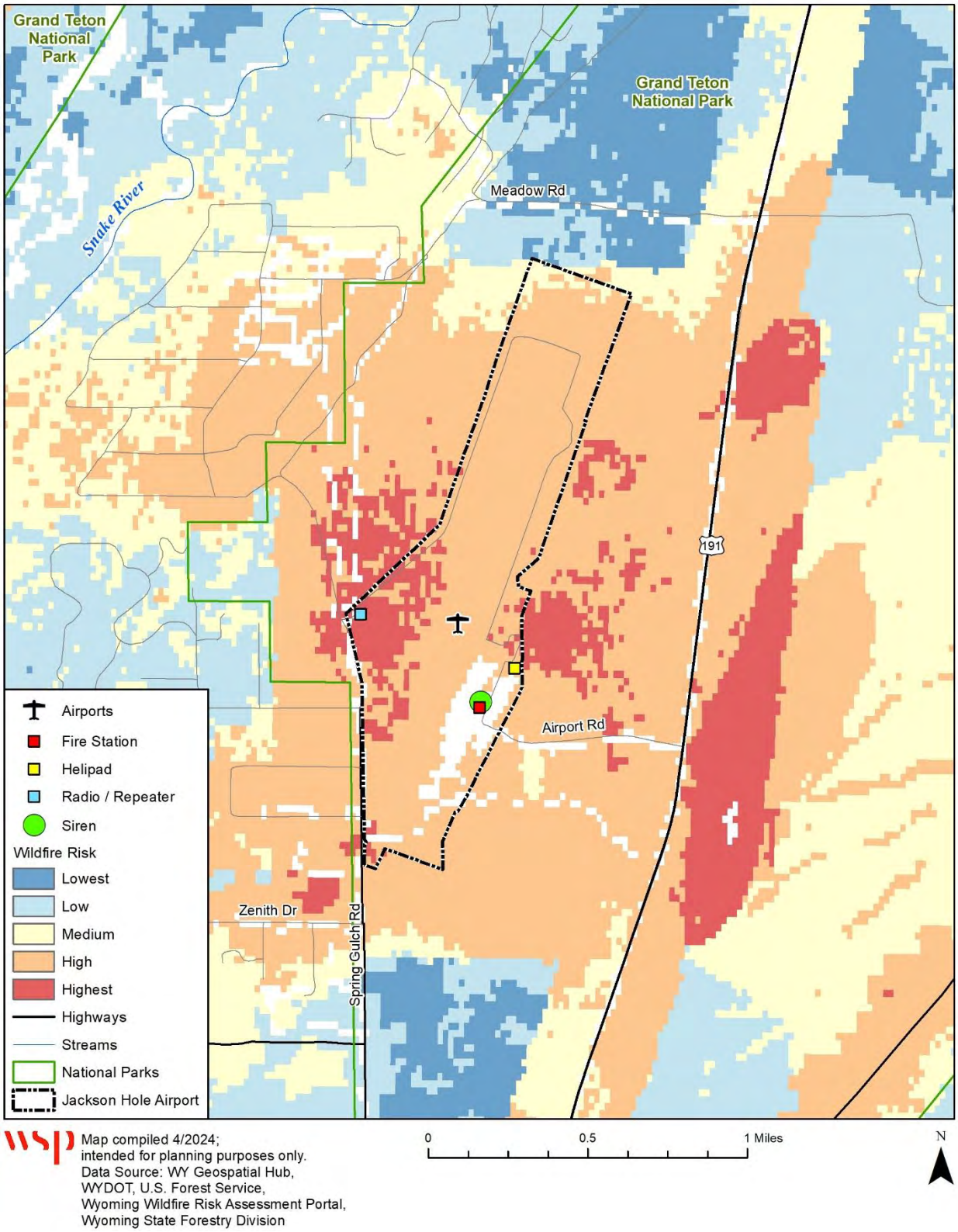
Map compiled 2/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, National Forest System,
Wyoming Wildfire Risk Assessment Portal,
Wyoming State Forestry Division

Figure 4-32 Flat Creek Watershed Improvement District Wildfire Risk



Map compiled 4/2024;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, U.S. Forest Service, FCWID,
Wyoming Wildfire Risk Assessment Portal,
Wyoming State Forestry Division

Figure 4-33 Jackson Hole Airport District Wildfire Risk



Extent (Magnitude)

Wildfire across the county can have a significant impact to property, facilities, and services. Also, there can be an impact on the economy as wildfires can coincide with the busy tourist season in the summer and fall months. This makes the overall potential magnitude of wildfires rather **critical**. It is crucial to recognize that although wildfires may only directly impact a limited portion of built environment such as infrastructure in towns and cities, the damage to the watersheds, viewsheds and other valued assets in the region can be extensive. This damage can have cascading effect on various aspects and sectors of the regional economy as well as cause long term lung and respiratory issues for people in the area due to smoke inhalation. The US Forest Service scale shown below classifies wildfires based on the number of acres burned. This can be used as a measure of extent or magnitude; several Class H fires have burned in the county and larger class fires, such as the Fish Creek/Pack Trail Fire that burned across multiple counties, can occur due to the expansive forests and wildlands in the region. The Fish Creek/Pack Trail Fire in 2024 burned nearly 90,000 acres and can be classified as Class I as shown in the table below.

Table 4-51 Fire Size Classification

SIZE CLASS	SIZE (ACRES)
Class A	≤ 0.25
Class B	0.26 – 9
Class C	10-99
Class D	100-299
Class E	300-999
Class F	1,000-4,999
Class G	5,000 to 9,999
Class H	10,000 to 49,999
Class I	50,000 to 99,999
Class J	100,000 to 499,999
Class K	500,000 to 999,999
Class L	1,000,000 + Acres

Source: NWCG Data Standard

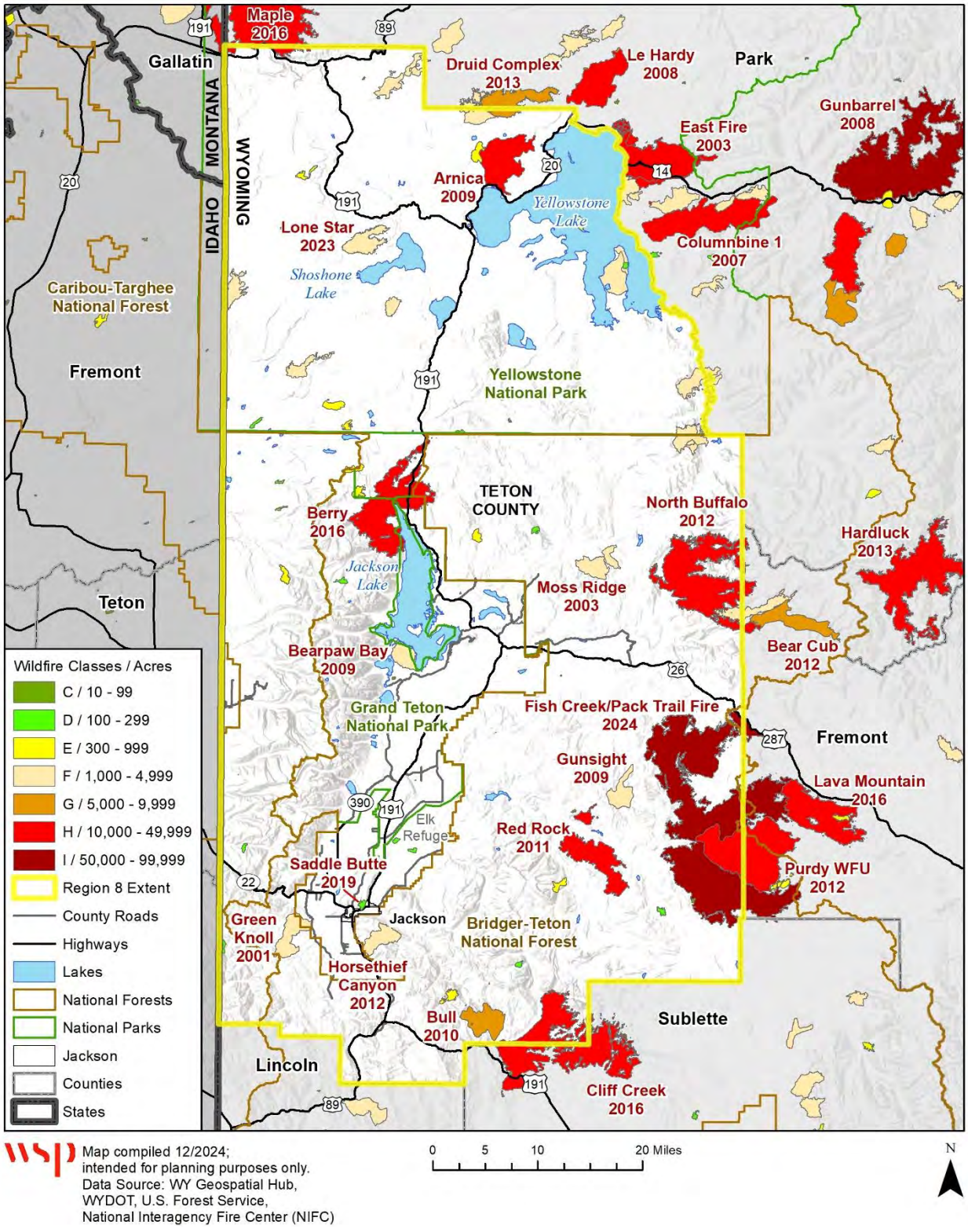
Previous Occurrences

The National Interagency Fire Center (NIFC) Database was used to analyze fire history in Teton County. The database, maintained by the USGS and other agencies, includes perimeter and point GIS layers for fires on public lands throughout the United States. The National Park Service, Bureau of Land Management, and U.S. Forest Service reports include fires of 10 acres and greater. The database is limited to fires on federal lands. Some fires may be missing altogether or have missing or incorrect attribute data. Some fire information may be lacking in the database because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters had not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should be used cautiously for statistical or analytical purposes.

Wildfires are highly likely to occur in Teton County. It is important to note that the risk of wildfires occurring may increase during times of drought, especially in prolonged droughts. According to Teton County, wildfire season typically occurs from June to October, with July and August having the highest occurrences of wildfires. NCEI reported 36 wildfires since 2000 throughout Teton County.

Figure 4-34 shows wildfires that have affected the area based on the National Interagency Fire Center.

Figure 4-34 Teton County Past Wildfire Occurrences, 2000-2024



Probability of Future Events

Wildfires continue to pose a threat to all jurisdictions in Teton County. Wildfires are **highly likely** to occur in Teton County each year. Teton Conservation District noted that there has been an increase in resource allocation to wildfire mitigation following fires adjacent to developed areas. It is important to note that the risk of wildfires occurring may increase during times of drought, especially in prolonged droughts. Hot, dry weather conditions, paired with low humidity and high winds, can increase the likelihood of wildfires in the county. Shifts in climatic patterns have extended the average wildfire season. Years with low snowfall and premature snowmelt, among other factors, diminish moisture levels during the summer and gal, heightening the likelihood and intensity of wildfires by fostering dry conditions conducive to ignition.

Climate Change Impacts

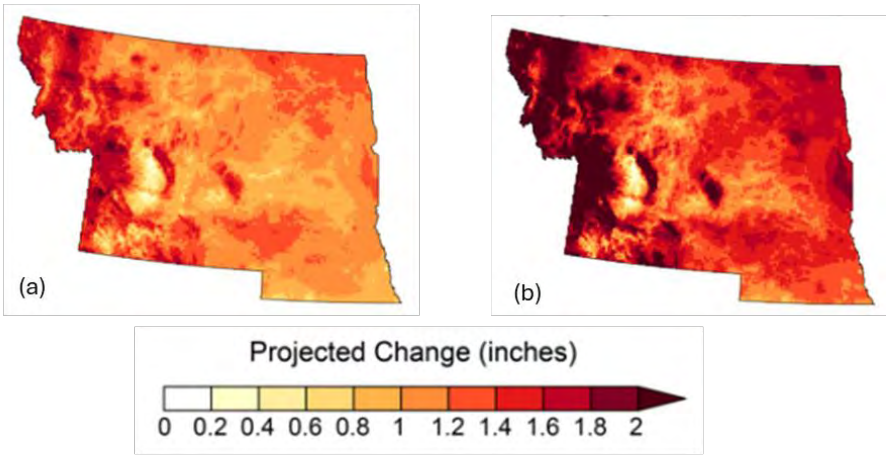
The threat of severe wildfire is expected to increase due largely to climate-change related increases in warmer air temperatures and drought. Historically, snow cover limited wildfire in Teton County. However, climate change has led to earlier spring snowmelt, which is correlated with increased fire activity.[1] In forested areas of Montana and Wyoming, wildfire numbers and fire-season length increased from the 1970s to the 2000s by 89% and 85 days, respectively.[2] The effects of climate change on evapotranspiration, a key driver of drought, is expected to increase as much or more in Teton County than anywhere in Wyoming (Figure 4-35).

The effect of severe heat and drought on wildfire in Wyoming is both intuitive and evident in environmental data. Widespread and severe drought affected the state in 2012 and 2020, which were statistically two of the worst wildfire years in state history.[3] Uncertainty remains in placing a number on the amount of increase in wildfire acreage over time, but the change may be large.

[1] Westerling, A.L., 2016, Increasing western US forest wildfire activity: Sensitivity to changes in the timing of spring. Philosophical Transactions of the Royal Society B, Biological Sciences Geophysical Research Letters, *371*(1696). https://royalsocietypublishing.org/doi/pdf/10.1098/rstb.2015.0178.
[2] National Climate Assessment 5 (2023) Chapter 25, Northern Great Plains, https://nca2023.globalchange.gov/downloads/NCA5_Ch25_Northern-Great-Plains.pdf.
[3] NOAA National Centers for Environmental Information, State Climate Summaries 2022: Wyoming. https://statesummaries.ncics.org/chapter/wy/

Figure 4-35 Projections of future evapotranspiration.

Projected change in potential evapotranspiration, 2036-2065, under intermediate emissions scenario (RCP 4.5, image a), and very high emissions scenario (RCP 8.5, image b).



Adapted from: National Climate Assessment 5 (2023) Chapter 25, Northern Great Plains, https://nca2023.globalchange.gov/downloads/NCA5_Ch25_Northern-Great-Plains.pdf.

Vulnerability Assessment

It is important to note that at the time of this HMP update the County had been in the process of developing an update to the Teton County CWPP, but the updated WUI mapping was not yet available. The wildfire vulnerability assessment in this HMP subsequently references the WUI as it was delineated in the 2014 Teton County CWPP and uses WYWRAP data for the vulnerability assessment. Readers should refer to the 2024 Teton County CWPP upon approval for the most up to date WUI mapping available. The Teton County CWPP will further inform future updates to this Regional HMP.

PEOPLE

The most vulnerable populations to wildfire reside in the wildland-urban interface (WUI) zones, where residential properties encroach directly into traditional wildland areas. Indirect impacts of wildfires on people include the pervasive smoke emitted from fires within the region. Over recent years, wildfires have significantly reduced air quality across the Western United States. Dense smoke poses risks to individuals with compromised health as well as those considered healthy.

Population at-risk estimates were developed by multiplying the average household size from the U.S. Census Bureau for the county by the number of residential structures found within each wildfire risk category based on WYWRAP data. The results are shown below.

Table 4-52 Population Risk to Wildfire Hazards

JURISDICTION	STRUCTURE COUNT HIGHEST	STRUCTURE COUNT HIGH	STRUCTURE COUNT MEDIUM	TOTAL RESIDENTIAL COUNT	POPULATION
Jackson	84	12	22	118	289
Unincorporated	657	1,951	1,553	4,161	9,695
Total	741	1,963	1,575	4,279	9,984

Source: Teton County, Wyoming CAMA 2024, Wyoming Wildfire Risk Assessment Portal, WSP GIS Analysis

However, specific populations that are vulnerable to a wildfire include those unable to evacuate as well as those with health risk that can be accelerated with smoke inhalation. This includes individuals with disabilities, the elderly, or anyone with limited access to main roads. According to the United States Census, within Teton County 18.5% of the population is over the age of 65 and 2.7% is under the age of 65 with a disability. People within these categories need extra planning for safe and timely evacuations and care once relocated.

BUILT ENVIRONMENT

The potential impacts of wildfires on the built environment includes destruction of infrastructure, residences, and other structures within wildfire-prone areas. Properties situated in high and very high hazard zones, including the Wildland-Urban Interface (WUI), as well as those within forested regions like national parks and forests, face the greatest risk. Structures made of flammable materials are particularly susceptible during wildfire events.

The vulnerability of properties typically increases with increasing proximity to wildfire-prone areas. This vulnerability is further heightened if neighboring properties lack adequate fire mitigation measures. Effective mitigation strategies entail employing flame-resistant construction materials, maintaining sufficient distance between structures and vegetation, and implementing vegetation management practices such as underbrush and tree clearing. Both the Teton Area Wildfire Protection Coalition and the Teton County Community Wildfire Protection Plan (CWPP) recognize that establishing proper defensible space is crucial for safeguarding structures and minimizing future impacts.

A wildfire risk vulnerability assessment was performed for Region 8 using Geographic Information Systems (GIS). The vulnerability assessment was performed for Teton County using the following GIS methodology. The County's parcel layer, address point data, and associated assessor's building improvement valuation data were provided by the County and were used as the basis for the inventory. GIS was used to spatially join the address point layer to the County parcel layer to obtain the number of buildings per parcel. Only parcels with improvement values greater than zero were used in the analysis. This method assumes that improved parcels have a structure of some type.

The Wyoming State Forestry's wildfire risk layer was then overlaid in GIS on the joined address point and parcel layers to identify structures that would likely be at risk from Highest to Lowest risk. Building improvement values for those points were then extracted from the parcel/assessor's data and summed for each jurisdiction in the study area. Content values were estimated for the buildings based on their occupancy type, using FEMA methodology. This includes 100% of the structure value for agricultural, commercial, and exempt structures, 50% for residential structures, and 150% for industrial structures. Building and content values were then totaled by wildfire risk type. Table 4-53, Table 4-54, and Table 4-55 summarize the estimated exposed value of improvements in each wildfire risk category.

Table 4-53 Teton County at Risk to Highest Wildfire Risk by Jurisdiction and County

Jurisdiction	Property Type	Parcel Count	Structure Count	Improved Value	Content Value	Total Value	Population
Jackson	Commercial	23	24	$67,020,092	$67,020,092	$134,040,184	
	Multi-Use	1	1	$335,379	$335,379	$670,758	2
	Res Vacant Land	3	3	$10,039,314	$5,019,657	$15,058,971	7
	Residential	80	80	$143,168,163	$71,584,082	$214,752,245	196
	Total	**107**	**108**	**$220,562,948**	**$143,959,210**	**$364,522,158**	**206**
Unincorporated	Agricultural	5	8	$5,335,475	$5,335,475	$10,670,950	
	Com Vacant Land	2	58	$341,157	$341,157	$682,314	
	Commercial	121	172	$159,711,323	$159,711,323	$319,422,646	
	Res Vacant Land	1	1	$3,321,460	$1,660,730	$4,982,190	2
	Residential	638	656	$1,005,306,157	$502,653,079	$1,507,959,236	1,528
	Total	**767**	**895**	**$1,174,015,572**	**$669,701,764**	**$1,843,717,336**	**1,531**
	Grand Total	**874**	**1,003**	**$1,394,578,520**	**$813,660,973**	**$2,208,239,493**	**1,737**

Source: Teton County, Wyoming CAMA 2024, Wyoming Wildfire Risk Assessment Portal, WSP GIS Analysis

Table 4-54 Teton County at Risk to High Wildfire Risk by Jurisdiction and County

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE	POPULATION
Jackson	Commercial	34	34	$30,258,114	$30,258,114	$60,516,228	
	Residential	12	12	$7,837,117	$3,918,559	$11,755,676	29
	Total	**46**	**46**	**$38,095,231**	**$34,176,673**	**$72,271,904**	**29**
Unincorporated	Agricultural	26	28	$59,046,715	$59,046,715	$118,093,430	
	Com Vacant Land	3	35	$506,497	$506,497	$1,012,994	
	Commercial	89	111	$360,584,328	$360,584,328	$721,168,656	
	Multi-Use	1	1	$630,798	$630,798	$1,261,596	2
	Res Vacant Land	16	16	$16,997,778	$8,498,889	$25,496,667	37
	Residential	1,913	1,934	$3,875,155,152	$1,937,577,576	$5,812,732,728	4,506
	Total	**2,048**	**2,125**	**$4,312,921,268**	**$2,366,844,803**	**$6,679,766,071**	**4,546**

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE	POPULATION
	Grand Total	**2,094**	**2,171**	**$4,351,016,499**	**$2,401,021,476**	**$6,752,037,975**	**4,575**

Source: Teton County, Wyoming CAMA 2024, Wyoming Wildfire Risk Assessment Portal, WSP GIS Analysis

Table 4-55 Teton County at Risk to Medium Wildfire Risk by Jurisdiction and County

JURISDICTION	PROPERTY TYPE	PARCEL COUNT	STRUCTURE COUNT	IMPROVED VALUE	CONTENT VALUE	TOTAL VALUE	POPULATION
Jackson	Commercial	5	5	$5,472,246	$5,472,246	$10,944,492	
	Residential	21	22	$7,457,506	$3,728,753	$11,186,259	54
	Total	**26**	**27**	**$12,929,752**	**$9,200,999**	**$22,130,751**	**54**
Unincorporated	Agricultural	21	22	$36,346,043	$36,346,043	$72,692,086	
	Com Vacant Land	3	3	$898,920	$898,920	$1,797,840	
	Commercial	34	34	$203,271,023	$203,271,023	$406,542,046	
	Multi-Use	1	1	$2,072,542	$2,072,542	$4,145,084	2
	Res Vacant Land	8	10	$27,181,435	$13,590,718	$40,772,153	23
	Residential	1,537	1,542	$4,449,817,064	$2,224,908,532	$6,674,725,596	3,593
	Total	**1,604**	**1,612**	**$4,719,587,027**	**$2,481,087,778**	**$7,200,674,805**	**3,618**
	Grand Total	**1,630**	**1,639**	**$4,732,516,779**	**$2,490,288,777**	**$7,222,805,556**	**3,672**

Source: Teton County, Wyoming CAMA 2024, Wyoming Wildfire Risk Assessment Portal, WSP GIS Analysis

An alternative approach to gauging vulnerability involves assessing the value of structures within wildfire risks zones. It was assumed that parcels with a non-zero improves value were developed, thus only these parcels and their values were analyzed. This analysis which includes the value of structures and estimated contents, provides insight into potential wildfire losses. As shown in Table 4-56, an estimated $16,183,083,023 in total property value is potentially exposed to highest to medium wildfire hazards throughout Teton County.

Table 4-56 Wildfire Hazard Exposure

JURISDICTION	TOTAL PARCELS	STRUCTURE COUNT HIGHEST	STRUCTURE COUNT HIGH	STRUCTURE COUNT MEDIUM	TOTAL STRUCTURE COUNT	IMPROVED VALUE	ESTIMATED CONTENT VALUE	TOTAL VALUE	POPULATION
Jackson	179	108	46	27	181	$271,587,931	$187,336,881	$458,924,812	289
Unincorporated	4,419	895	2,125	1,612	4,632	$10,206,523,867	$5,517,634,344	$15,724,158,211	9,695
Total	**4,598**	**1,003**	**2,171**	**1,639**	**4,813**	**$10,478,111,798**	**$5,704,971,225**	**$16,183,083,023**	**9,984**

Source: Teton County, Wyoming CAMA 2024, Wyoming Wildfire Risk Assessment Portal, WSP GIS Analysis

ECONOMY

The economic impacts of wildfire include loss of property, direct agricultural sector job loss, secondary economic losses to business in or near wildland resources like parks, national forests, and loss of public access to recreational resources. Teton County depends on ecotourism as a primary driver of its economy. Wildfire smoke can also deter this tourism and have a negative impact on the economy. Damage to these assets or disruption of access to them can have far reaching negative impacts to the local economy. Fire suppression may also require increased cost to local and state government for water acquisition and delivery, especially during periods of drought when water resources are scarce.

CRITICAL FACILITIES AND LIFELINES

Wildfire can have significant repercussions on critical facilities, ranging from structural harm or compete destruction to endangering individuals within these facilities, disrupting transportation, shipping, and evacuation operations, and halting facility operations and essential services. The interruption of facility operations can have cascading effects disrupting essential services such as power supply, water treatment, and emergency medical care. Loss of functionality in these facilities not only jeopardizes immediate safety but also has long-term economic, environmental and public health consequences.

To assess the potential impact of wildfires on critical facilities and lifelines, a Geographic Information System (GIS) overlay was conducted using wildfire hazard layers and critical facility point data. However, due to the unavailability of replacement values within the data, a precise estimate of potential monetary loss could not be determined. Nonetheless, the consequences of damage to these facilities extend beyond mere property loss, potentially triggering cascading impacts throughout various sectors. Summary tables of these results are shown below in Table 4-57 through Table 4-59, highlighting the type and number of facilities that are located in Highest, High, and Medium Wildfire risk areas. Each table includes only the facilities located within that specific hazard classification; they are not cumulative of the classifications below them.

Table 4-57 Critical Facilities at Risk to Highest Wildfire

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	1	-	-	1	1	-	**3**
Unincorporated	7	7	2	13	5	19	18	3	5	**79**
Total	**7**	**7**	**2**	**14**	**5**	**19**	**19**	**4**	**5**	**82**

Source: Teton County, Emergency Management, WYWRAP, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

Table 4-58 Critical Facilities at Risk to High Wildfire

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	-	-	1	-	-	-	**1**
Unincorporated	10	3	-	15	2	3	24	5	3	**65**
Total	**10**	**3**	**0**	**15**	**2**	**4**	**24**	**5**	**3**	**66**

Source: Teton County, Emergency Management, WYWRAP, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

Table 4-59 Critical Facilities at Risk to Medium Wildfire

JURISDICTION	COMMUNICATIONS	ENERGY	FOOD, HYDRATION, SHELTER	HAZARDOUS MATERIAL	HEALTH AND MEDICAL	SAFETY AND SECURITY	TRANSPORTATION	WATER SYSTEMS	OTHER	TOTAL COUNT
Jackson	-	-	-	-	-	1	-	-	-	**1**
Unincorporated	10	4	-	7	1	12	15	7	-	**56**
Total	**10**	**4**	**0**	**7**	**1**	**13**	**15**	**7**	**0**	**57**

Source: Teton County, Emergency Management, WYWRAP, HIFLD, National Bridge Inventory, National Inventory of Dams, WSP GIS Analysis

In regard to the special districts, GIS analysis indicates that the Jackson Hole Airport's airport facilities and infrastructure are in a highest wildfire risk category, and parts of the airport include areas of High including the repeater in the Airport Lighting Vault and the Air Traffic Control Tower. The FCWID analysis revealed that a water treatment well (Town of Jackson Well #5) was in an area of highest wildfire risk.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

A portion of the County comprises of National Forests and Grasslands, housing numerous natural and cultural treasures that are susceptible to potential risks. Wildfires can result in the contamination of drinking water sources, both surface-level and in wells. Moreover, wildfires occurring within national forests can have broader county impacts, affecting summer tourism and various economic sectors.

The detrimental effects of wildfires extend to critical habitats, such as mule deer winter ranges and sage-grouse breeding and winter habitats, particularly when significant areas of sagebrush are consumed by fire. However, it's worth noting that wildfires can also facilitate the rejuvenation of natural ecosystems, fostering healthy ecological renewal in areas previously affected by native species.

Historic and cultural resources share a vulnerability akin to general properties, with vulnerability increasing nearer to the Wildland-Urban Interface (WUI) and in landscapes with

less fire mitigation. Additionally, older buildings, particularly those exempt from internal fire mitigation measures like sprinklers and fire suppression technology, may face heightened vulnerability.

Land Use and Development Trends

The wildland/urban interface (WUI) has become a highly desirable location for residential development, as evidence by national and statewide trends. There is a growing number of homes being constructed within the interface, although Wyoming generally has less developed WUI compared to other western states. This has led to a general increase in vulnerability to wildfire for the County, Town of Jackson, and Teton Conservation District due to development over the last 5 years. Despite this, there remains potential for future home construction in undeveloped, forested private lands adjacent to fire-prone public lands throughout Wyoming.

Constructing homes in these high-risk areas poses significant threat to lives and property in the event of wildfires. Regulating growth in these areas requires a delicate balance between safeguarding private property rights and promoting public safety. In the event of WUI growth, local government may consider implementing regulations regarding subdivision entrance/exit roads and bridges to ensure the safety of property owners and fire personnel. Building consideration, particularly for land on slopes exceeding 25%, should prioritize access for fire protection of structures. Additionally, water supply requirements, including provisions for ponds, fire apparatus access, pumps, and backup generators are essential for safeguarding residents, properties, and emergency service personnel, as well as conserving government and public resources.

Teton County has implemented various strategies to safeguard life and property against the impacts of uncontrolled wildfires. Among these approaches, the establishment, adoption, and enforcement of codes and regulations play a crucial role. Jackson Hole Fire/EMS oversees compliance with codes such as the International Fire Code, the International Wildland-Urban Interface Code, and the Teton County Fire Protection Resolution for New Subdivisions. Each code is tailored to mitigation fire risks to property in distinct ways, influencing the design on infrastructure and buildings within interface areas.

These regulations address both the fire resistance of structures within the interface and their susceptibility to ignition. Structures situated or planned for construction within high-risks zones must adhere to stringent standards for both interior and exterior protection. Additionally, these codes empower the County to mandate vegetation management near structures and throughout subdivisions. The Teton County Fire Protection Resolution for New Subdivisions serves the purpose of ensuring adequate emergency access and egress routes, as well as reliable and sufficient water supply for firefighting efforts.

Risk Summary

In summary, wildfire is a high significance for Teton County. Through variability exists between jurisdiction, summarized in Table 4-60 Key issues relating to wildfire are as follows.

- Wildfire is considered to be overall **High** significance for the County.
- Socially vulnerable populations are likely to experience the worst effects of wildfire.
- The potential magnitude of wildfires throughout the county is ranked as critical.
- The geographical extent of wildfire in Teton County is ranked at Significant.
- Property, structures, and critical infrastructure is at moderate to extreme risk from wildfire throughout the county.

- Parts of the county that is surrounded by more fire-prone landscapes (e.g., forests and rangelands), generally have structures and critical infrastructure most at risk to extreme wildfire.
- As climate change increases, drought will be more likely and the detrimental impacts on human health and the built environment from wildfire will likely increase as the fire season becomes extended.
- Related Hazards: Drought, Floodings, Severe Summer Weather.

Table 4-60 Risk Summary by Jurisdiction: Wildfire

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	High	This will need to be coordinated with the new CWPP when it is published, as WUI areas are likely to increase.
Town of Jackson	High	The outskirts of the Town of Jackson are at higher risk to wildfire; there is potential for a large conflagration to spread throughout the Town if a wildfire was able to ignite this area. Smoke can cause health impacts to residents, and evacuations can create severe economic impacts.
Teton Conservation District	High	Severity of smoke events and potential to affect watersheds and increase erosion in burn scars.
Flat Creek Watershed Association	High	Wildfires lead to increase post-fire flooding, runoff, and sedimentation which negatively impact stream health.
Jackson Hole Airport	High	The airport facilities are at lower risk of wildfire but impacts of a large fire would still be felt. Disruptions to flights could occur.

4.2.10 Severe Summer Weather

Description

For this plan, severe summer weather in Teton County includes hail, lightning, extreme heat, and thunderstorms. A brief description of these weather phenomena is presented below. More information on thunderstorm winds, high winds, and tornadoes, which typically are associated with summer weather, can be found in the tornado/windstorm section of this plan.

HAIL

Hail formation begins when raindrops are carried upward by powerful updrafts into extremely cold regions of the atmosphere, where they freeze into ice. As these particles grow in size, they eventually become heavy enough to overcome the strength of the updraft and fall towards the Earth due to gravity. During their descent, hailstones may undergo a cycle of thawing, rising back into the updraft, and refreezing multiple times, gradually increasing in size. While hailstones are typically less than two inches in diameter, larger sizes have been reported, with some reaching speeds of up to 120 mph. Severe hail is classified as hailstones measuring 1 inch diameter or larger. Hailstorms are often associated with thunderstorms and tend to occur during the summer months in the County.

LIGHTNING

Lightning is an electrical discharge that results from the building of positive and negative charges within a thunderstorm and the earth's surface. When the buildup becomes strong enough, lightning appears as a "bolt". This flash of light usually occurs within the clouds or between the clouds and the ground. The electrical charge and intense heat of lightning can have devastating effects including electrocution upon contract, tree damage, fire ignition, and disruptions to electrical system.

This visible discharge can occur within or between clouds and the surrounding air, between clouds and the ground, or between the ground and clouds. Among these types of cloud-to-ground lightning is the most hazardous, although less frequent. Lightning often strikes outside the main rain area of the thunderstorm, sometimes extending 5-10 miles away from the storm itself. This can catch many who are outdoors by surprise if they do not receive sufficient warning.

THUNDERSTORMS

A thunderstorm is defined as a storm that contains lightning and thunder, which is caused by unstable atmospheric conditions. When the colder upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop, resulting in thunderstorms. This can occur singularly, in clusters, or in lines. The lifting of moist atmosphere can also occur due to terrain, such as mountain ranges, in a phenomenon known as orographic lift. Typically, this rain-bearing cloud will also produce lightning. Other hazards associated with thunderstorms and lightning include heavy rains causing flash flooding (discussed separately in section 4.2.4) and tornadoes and windstorms (discussed further in section 4.2.8).

EXTREME HEAT

According to FEMA, extreme heat is characterized by an extended period (2 to 3 days) of elevated heat and humidity, with temperatures surpassing 90 degrees Fahrenheit. Ambient air temperatures represent one aspect of heat conditions, while relative humidity constitutes the other. The interplay between these factors gives rise to what is termed the apparent temperature. The heat index is a numerical representation in degrees Fahrenheit, indicating how hot it genuinely feels when factoring in relative humidity alongside the actual air temperature. Exposure to direct sunlight can further elevate the heat index by a minimum of 15 degrees. Extreme heat poses a significant strain on both animals and humans, particularly impacting vulnerable demographics such as the elderly, individuals with health conditions, and young children.

Figure 4-36 NWS Heat Index and Potential for Health Effects

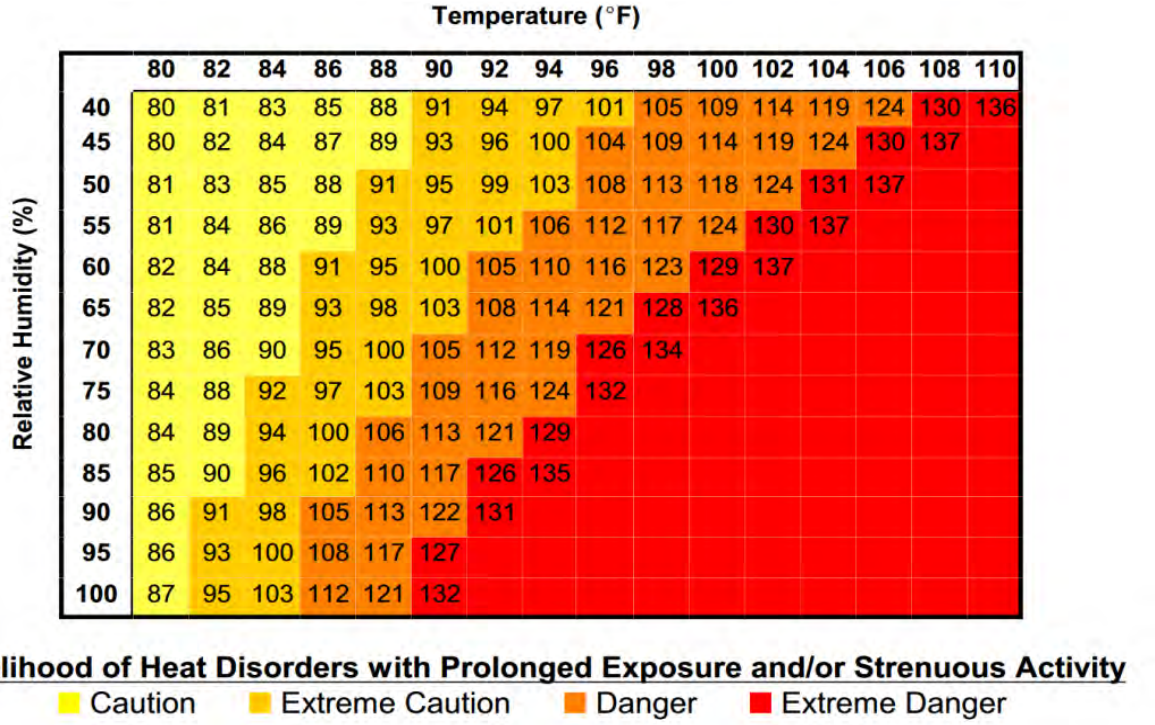


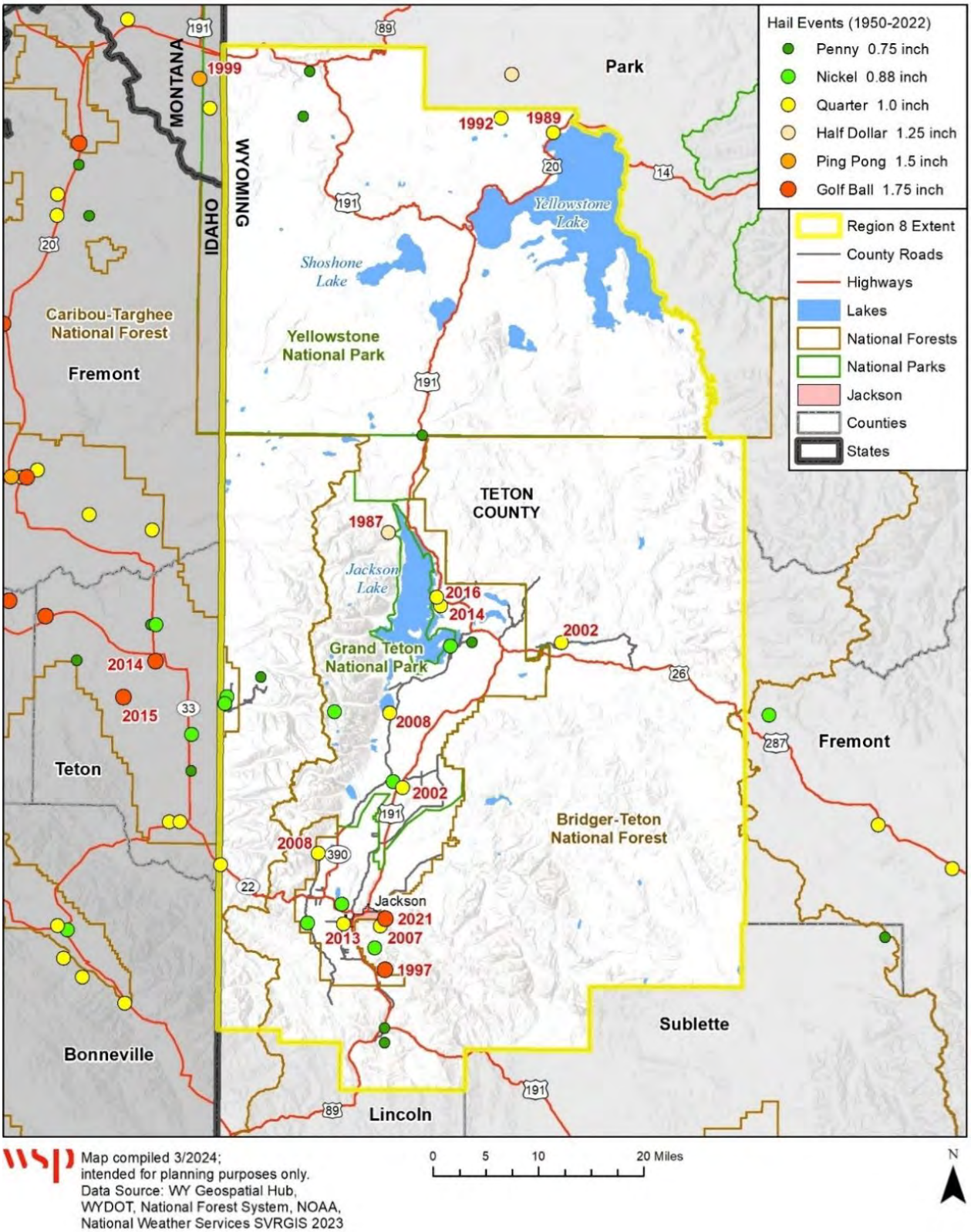
Image adapted from https://www.weather.gov/ama/heatindex

Note: Heat index values here are for shady locations. Exposure to direct sunlight can increase these values by up to 15 degrees Fahrenheit.

Location

Teton County is vulnerable to experiencing severe summer weather, but there are regional variations apparent when looking at the frequency of events. Certain hazards, like extreme heat events, have a regional scope and often affect multiple or all counties within the planning area simultaneously. In contrast, hazards such as lightning, hail, and heavy rain tend to impact more localized areas. Lightning typically strikes specific points, with occurrences of multiple strikes on people or property during a single storm event being rare. Hail and heavy rain typically manifest in isolated pockets within accompanying storms. Town of Jackson has the majority of the parks and ballfields in the County that could be at high risk of severe summer weather. Parks and Pathways have installed NWS “When Thunder Roars, Go Indoors” signs at all entrances to parks and pathways. The County faces the highest risk of large gatherings at top of Snow King Mountain, Teton Village, the Jackson Town Square, Jackson Hole Center for the Arts, and Targhee Resort, which could be affected by severe summer weather. Figure 4-37 below displays the hail history in Wyoming.

Figure 4-37 Teton County Hail Events 1950-2022



Extent (Magnitude)

Severe summer weather can cause damage to buildings, homes, and other property but rarely cause death, serious injury, or long-lasting health effects. However, significant economic losses from property and crop damage, as well as several reported injuries and deaths have occurred in the county; therefore, the severity of summer weather is ranked as **moderate** for Teton County. In numerical measurements, severe summer weather events are often categorized based on criteria established by organizations such as National Weather Service (NWS). The NWS reports that severe summer weather has caused $487,000 in property damage and $0 in crop damage since 1950 in Teton County. Two deaths and 54 injuries were attributed to lightning strikes. Across the country, large hail results in nearly $1 billion in damage annually to property and crops. The extent for specific severe summer weather hazards is described below.

HAIL

Hail events are often associated with thunderstorms that may also cause high winds and tornadoes. Hail causes nearly $1 billion in damage to crops and property each year in the United States. Hail is also one of the requirements which the National Weather Service uses to classify thunderstorms as 'severe.' If hailstones of more than one inch in diameter are produced in a thunderstorm, the storm qualifies as severe.

The National Weather Service (NWS) classifies hail by diameter size and corresponding everyday objects to help relay scope and severity to the population. Table 4-61 indicates the hailstone measurements utilized by the National Weather Service.

Table 4-61 Common Hailstone Measurements

AVERAGE DIAMETER (IN INCHES)	CORRESPONDING HOUSEHOLD OBJECT
.25	Pea
.5	Marble/Mothball
.75	Dime/Penny
.875	Nickel
1.0	Quarter
1.5	Ping-pong Ball
1.75	Golf Ball
2.0	Hen Egg
2.5	Tennis Ball
2.75	Baseball
3.0	Teacup
4.0	Grapefruit
4.5	Softball

Data attained from https://www.spc.noaa.gov/misc/tables/hailsize.htm

Hailstorms occur during severe storms, which are regional in nature. However, just as the amount of precipitation in the form of snow or rain may vary significantly within a single storm, so may the amount, size, and duration of hail within a severe storm. This can have a wide range of impacts.

LIGHTNING

Lightning is an electrical discharge between positive and negative regions of a thunderstorm. Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually, it takes place inside the cloud and looks from

the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel can be visible for many miles.

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

THUNDERSTORMS

It is possible for the entire county to be affected by a large thunderstorm and lightning event, but effects are often localized. One or more severe thunderstorms occurring over a short period can lead to flooding and cause extensive damage to power systems, communication outages, and agricultural damage. In extreme or isolated circumstances, severe thunderstorms can bring straight-line winds in excess of 100 mph. Straight-line winds are responsible for most thunderstorm damage. High winds can damage trees, homes, and businesses.

EXTREME HEAT

Extreme heat is considered to have a limited magnitude and severity. Due to the high elevation of Teton County, extreme heat is a historically unusual occurrence, but unusually hot weather has been having impacts in recent years as many older buildings and residential structures do not have air conditioning. Extreme heat events typically occur with ample warning time. Weather forecasters predict heat events several days before they occur.

Previous Occurrences

The NCEI database was used to gather information on historic severe summer weather in Teton County, Wyoming. The NCEI Storm Events Database is a comprehensive list of oceanic, atmospheric and geophysical data across the United States and aggregated by county and zone. Table 4-62 summarizes the data from NCEI for lightning, hail, extreme heat, and thunderstorms from 1970-2023. It is important to note that all severe summer weather events get reported by the NCEI and losses are estimates, therefore, actual losses may be higher than those reported below. Based on this data, thunderstorms are the most frequently occurring and damaging severe summer weather event in Teton County. Only lightning has resulted in casualties. The NCEI recorded $487,000 in property losses due to severe summer weather events in Teton County from 1970-2023. However, the Storm Events Database uses data from the National Weather Service (NWS) for historical and current events, so any property loss data that was not reported to NWS will not be represented.

Table 4-62 Summary of Historic summer weather Events and Losses

	DEATHS	INJURIES	PROPERTY LOSS	DAYS WITH EVENTS	TOTAL EVENTS
Lightning	2	53	$0	8	10
Hail	0	2	$0	23	34
Extreme Heat	0	0	$0	2	3
Thunderstorms	0	1	$487,000	45	51
Total	**2**	**56**	**$487,000**	**78**	**98**

Source: NCEI

The NCEI dataset reports details on several of the severe weather events in Teton County that cause injuries or fatalities:

- July 26, 2003: Woman was struck by lightning strike while hiking in Grand Teton. She was among 13 other climbers. The lightning strike resulted in 1 death and 5 injuries among all the climbers.
- June 21, 2005: Lightning hit approximately 15 yards from a boardwalk encircling Old Faithful Geyser in Yellowstone National Park, injuring eleven bystanders who were gathered to witness the eruption of the renowned geyser. Among the victims was a 12-year-old boy who received prompt CPR and was successfully resuscitated. Subsequently, he was airlifted to a regional medical center for further treatment.
- July 21, 2010: Lightning struck in Grand Teton Mountain in Grand Teton National Park, causing 17 climbers who were part of three separate private climbing parties. Tragically, one of the injured climbers ultimately fell 2,000 feet to his death as an indirect consequence of the lightning strike. National Park Service rangers were transported by helicopters to the renowned mountain to rescue the injured climbers. Surviving climbers endured moderate to severe injuries, ranging from burns to numbness. A total of 83 individuals contributed to the rescue efforts.
- August 2, 2022: This event happened at Enos Lake in the Teton Wilderness, when a group of backpackers were camping. This event resulted in one death, while another male sustained minor injuries. It was reported that the backpackers were struck while at camp. In total, they were a part of a group of 14.

Probability of Future Events

The frequency of severe summer weather events in Teton County is ranked as **Highly Likely**. Since 1970, 98 severe summer events have been recorded in the County. As discussed above, there are variations in frequency and severity of damage from severe summer weather across Teton County. Based on the NCEI data demonstrated above, it shows that hail, lightning, extreme heat, and thunderstorms are common throughout the county.

Climate Change Impacts

The impact of climate change on hail, lightning, and extreme heat, and thunderstorm hazards in Teton County is variable. NCA5 provides a summary of recent climate research and documents unprecedented increases in hail frequency and size in the Northern Great Plains.[4] Hail is a significant hazard in Teton County (Table 4-62) and any potential increase is worth consideration. Fortunately, by far the most extreme hail hazard exists in the southeastern part of Wyoming, the opposite corner of the state.[5]

The impact of climate change on lightning has received comparatively little attention in recent research. The NOAA State Climate Summary for Wyoming (2022) and NCA5 each mention lightning only once, either acknowledging that it exists or that it is relevant to wildfire ignition.

Nationwide, extreme heat is responsible for more climate-related deaths than any other factor. The Northern Great Plains is fortunate to have not experienced an increase in this hazard to the

[4] National Climate Assessment 5 (2023) Chapter 25, Northern Great Plains, https://nca2023.globalchange.gov/downloads/NCA5_Ch25_Northern-Great-Plains.pdf.
[5] NOAA National Centers for Environmental Information, State Climate Summaries 2022: Wyoming. https://statesummaries.ncics.org/chapter/wy/

degree felt elsewhere. In fact, Teton County experiences very little extreme heat and has not recorded any financial loss to this hazard in recent years (Table 4-62). Air temperatures across the state have increased 2.5°F since 1900. However, Wyoming is not exempt from the impacts of climate changes and more mitigation strategies surrounding higher temperatures should be considered. According to researchers at the University of Wyoming, Teton County has experienced less of an increase in daytime highs than the global average, but there has been an increase in overnight lows, meaning nighttime temperatures have gotten progressively warmer. This increases the risk of wildfire ignition and the inability to slow the spread if one were to start.

Comparatively little research has evaluated the frequency and intensity of the thunderstorms. The effect of climate change on thunderstorms is not mentioned in NCA5 and the NOAA Climate Summary for Wyoming (2022) simply acknowledges that the state experiences this type of weather. Haberlie et al. (2022) evaluated the effects of climate change on thunderstorms in the eastern two-thirds of the United States, but did note a modest increase in low and medium severity thunderstorms in northwest Wyoming in both moderate and high GHG emissions scenarios.[6]

Vulnerability Assessment

In general, assets in the planning area are all vulnerable to severe summer weather including people, crops, livestock, vehicles, and built structures. The presence of buildings and people increase the potential for damage, injuries, and even death. As such, hail, lightning, extreme heat, and thunderstorm vulnerability are higher for the Town of Jackson than it is for Teton County as a whole, although areas of the county outside of public land exist that exhibit higher density of people and buildings. Hail can cause considerable damage to vehicles and buildings, but only rarely results in loss of life directly, although injuries can occur. Effects of this hazard could range from minimal, localized property damage to widespread or significant property damage affects a large portion of a jurisdiction.

PEOPLE

While the health-related impacts of severe summer weather affect all individuals, certain demographics, such as the elderly and young children, are particularly vulnerable. According to the Center for Disease Control (CDC), extreme heat is one of the leading causes of weather-related deaths in the United States. As previously mentioned, the elderly, young children, and people with weakened immune systems are often most susceptible. Aside from extreme heat, hail can cause serious injuries to unprotected people, like lightning strikes.

BUILT ENVIRONMENT

All outdoor property is equally exposed to severe summer weather events. For Teton County, it was reported that majority of the damage occurred due to thunderstorm winds. NCEI showed that thunderstorm winds were the only severe summer weather event that caused property or crop damage to the county. While there are no reported property damages for hail, lightning, and extreme heat, there is still a possibility of the hazard affecting the county.

ECONOMY

As seen from the NCEI dataset, severe summer weather can result in significant economic losses, particularly hail. NCEI recorded a total of $487,000 in property damage due to severe summer weather in Teton County from 1970-2023. However, the Storm Events Database uses data from National Weather Service (NWS) for historical and current events, so any property

[6] Haberlie, A.M., et al. (2022). Thunderstorm activity under intermediate and extreme climate change scenarios. *Geophysical Research Letters*, *49*(14), e2022GL098779.

loss data that was not reported to NWS will not be represented. Losses can be seen when severe storm events cause direct damage to property or crops, but indirect losses can be a result of the storms as well. Also, the increase in temperature throughout the county can impact tourism in the future and reduce revenue from tourism. In the event of flash flooding or extreme hail events, this can force businesses to close, and commuters will also be unable to drive to work, causing disruption in local economies.

CRITICAL FACILITIES AND LIFELINES

All infrastructure and critical facilities are equally vulnerable as severe storms impact the entire planning area without discrimination. For instance, hail can accumulate on highways, hindering the movement of commuters and emergency responders, thereby impacting travel safety and efficiency. Lightning on the other hand, can cause direct damage to buildings and infrastructure, especially if infrastructures are not protected by lightning protection systems. Any structural damage to critical facilities can compromise the functionality of the community.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES

Hailstorms have been known to inflict damage to crops and plants in the planning area, as well as break branches off trees. Additionally, lightning strikes can ignite fires in trees which in turn can impact vegetation and crops. Lastly, structures in poor condition or those not constructed to meet building codes are more susceptible to damage during severe weather occurrences.

Land Use and Development Trends

No specific new growth or development within the County, Town of Jackson, or the Teton Conservation District in the past five years has significantly altered the general risk to severe summer weather. There is a growing emphasis on constructing resilient buildings and infrastructure capable of withstanding severe summer weather. For example, ensuring that new infrastructures are built with durable materials that will be able to withstand high winds, hail, and other severe summer weather events. Considerations are also being made for mitigating against increasing summer temperatures with new buildings including air conditioning, particularly in government-subsidized housing projects that are typically occupied by socially vulnerable populations. Strategic planning initiatives in the Town of Jackson and Teton County prioritize directing density and services to existing population centers and clustered developments across the planning area. This intentional approach aims to restrict new areas of density, thus mitigating susceptibility to severe summer weather events, such as hail. However, it is important to note that any new development carries the risk of lightning strikes, which increases as the population grows in Teton County.

Risk Summary

- The hazard significance of severe summer weather (hail, thunderstorm, extreme heat, and lightning) in Teton County is ranked as **Low.**
- Teton County can be impacted by severe summer weather; therefore, the geographic extent is rated as **limited**.
- The NCEI dataset recorded 98 days of severe summer weather events in Teton County since 1970. Therefore, the probability of future occurrences is ranked as **Highly Likely**.
- The NCEI reported two deaths, 56 injuries and $487,000 in property damages since 1970, therefore the potential magnitude is ranked as **moderate**.
- Most people vulnerable to severe summer weather events are children, the elderly, individuals with pre-existing medical conditions, outdoor workers/enthusiasts, and people living in dense urban areas.
- All outdoor property is vulnerable to severe summer weather events in Teton County.
- Critical infrastructure such as roadways and electrical equipment are especially vulnerable to severe summer weather.

- Economic losses typically occur from thunderstorm winds in the County. Although, there is possibility of severe hail events and associated cost of repairs from hail damage. Areas with high infrastructure, are more likely to experience economic damages from severe summer weather events because there is a greater quantity of property that can be damaged.
- Related hazards: Drought, wildfire, and tornado/windstorms.

Table 4-63 Risk Summary by Jurisdiction: Severe Summer Weather

JURISDICTION	OVERALL SIGNIFICANCE	KEY ISSUES AND JURISDICTIONAL DIFFERENCES
County	Low	Lightning strikes in wilderness areas throughout the county can often trigger wildfires.
Town of Jackson	Low	Some potential to affect limited developed areas in Town limits, particularly from impacts of hail. Lighting strikes to critical infrastructure can cause cascading effects.
Teton Conservation District	NA	No impacts
Flat Creek Watershed Association	NA	No impacts
Jackson Hole Airport	Low	Thunderstorms can sometimes cause delays and sometimes temporarily ground flights.

5 Mitigation Strategy

5.1 Mitigation Strategy: Overview

This section describes the mitigation strategy process and mitigation action plan for the Region 8 Hazard Mitigation Plan. It describes how the participating jurisdictions in the Region met the following requirements from the 10-step planning process:

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

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the county's HMPC led to this mitigation strategy and action plan. Section Mitigation Goals Section 5.2 below identifies the goals of this plan, Section 5.3 describes the action identification and prioritization process, and Section 5.4 contains the updated mitigation action plan for 2025.

5.2 Mitigation Goals

Up to this point in the planning process, the county HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals and mitigation actions were reviewed and updated based on these tasks. During the 2025 update of this plan, the county HMPC held a series of meetings designed to achieve a collaborative mitigation strategy as described further throughout this section.

During the mitigation strategy workshop held on June 11, 2024, the HMPC reviewed the results of the hazard identification, vulnerability assessment, capability assessment and goals from the 2020 hazard mitigation plan as well as the State of Wyoming Multi-Hazard Mitigation Plan. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the county to update planning goals and to base the development of new or updated mitigation strategies for the Region.

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

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

During the 2025 update the goals from the 2020 plan were revisited at a series of meetings with the HMPC/LEPC. The four goals generally were still valid, but the group felt that re-ordering some of the goals was important to reflect current priorities. The goal of improving protection of the general population was moved to Goal 1 and revised to "minimize impacts of hazards…" Consideration of economic losses was added to Goal 4 to reflect the impacts that hazards have had on the local economy. The word "manage" was added to Goal 3 in regard to natural resources to reflect the emphasis on vegetative management for wildfire fuels and invasive removal. The goals as revised for the 2024 plan updated are as follows:

- **Goal 1:** Minimize impacts of hazards on the general population including residents, commuters, and visitors
- **Goal 2**: Protect existing and future critical facilities, utilities, infrastructure, and other FEMA community lifelines
- **Goal 3**: Protect, restore, and manage the environment to support community and environmental resiliency

- **Goal 4**: Continue to implement actions to mitigate the effect of hazards through education, ordinances, resolutions, and proper project analysis to enhance life safety and reduce property and economic losses

5.3 Identification and Analysis of Mitigation Actions

The next step in the mitigation strategy is to identify and analyze a comprehensive range of specific mitigation actions and projects to reduce the effects of each hazard on new and existing buildings and infrastructure. During the 2024 Regional Plan update, the HMPC analyzed viable mitigation actions by hazard that supported the identified goals. The HMPC was provided with the following list of categories of mitigation actions, which originate from FEMA's local hazard mitigation planning guidance:

- **Plan and Regulations (Prevention):** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
- **Structural and Infrastructure Projects:** Actions that involve the construction of structures to reduce the impact of a hazard.
- **Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.
- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.

To identify and select mitigation actions in support of the mitigation goals, the HMPC evaluated each hazard identified and profiled in Chapter 4. A link to reference documents titled "Mitigation Ideas" and "Mitigation Action Portfolio" developed by FEMA was made available in the meeting presentation. These documents list common ideas for mitigation by hazard and best practices. The jurisdictions considered both current and future buildings in considering possible mitigation actions. A facilitated discussion took place to examine and analyze the options.

The mitigation strategy is based on existing local authorities, policies, programs, and resources, as well as the ability to expand on and improve these existing tools. As part of the HMP development, the planning team reviewed existing capabilities for reducing long-term vulnerability to hazards. Those capabilities are noted in Chapter 3 and can be assessed to identify gaps to be addressed and strengths to enhance through new mitigation actions.

Based upon the key issues identified in the risk assessment, including the capability assessment, the planning team came to consensus on proposed mitigation actions for each hazard for their jurisdictions. Certain hazards' impacts were best reduced through multi-hazard actions. A lead agency or department for each new action was identified to provide additional details on the project so they could be captured in the plan.

5.3.1 Prioritization Process

Once the mitigation actions were identified, the HMPC reviewed and evaluated each action to come up a prioritization scale for the mitigation strategy. This prioritization process was largely done for the new actions developed in 2025; however, the planning team was given the opportunity to re-prioritize any continuing actions if they wanted. In order to accomplish this, the planning team utilized the STAPLEE prioritization criteria to determine the importance, effectiveness, and implementation steps of each action. The STAPLEE criteria were developed by FEMA as a means of standardizing a consistent set of evaluation criteria for all jurisdictions to follow. STAPLEE is an acronym for the following:

- **S**ocial: Does the measure treat people fairly? (e.g., different groups, different generations)
- **T**echnical: Is the action technically feasible? Does it solve the problem?

- **A**dministrative: Is there adequate staffing, funding, and other capabilities to implement the project?
- **P**olitical: Who are the stakeholders? Will there be adequate political and public support for the project?
- **L**egal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- **E**conomic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- **E**nvironmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

Other criteria used to inform the priority of a mitigation action included:

- Does the action address multiple hazards or areas with the highest risk?
- Does the action protect lives?
- Does the action protect infrastructure, community assets or critical facilities?
- Does the action meet multiple objectives?

While STAPLEE provided a template for the planning team to evaluate a range of specific mitigation actions and projects, the results of the risk assessment were also considered (i.e., probability and severity of impacts for each hazard). During this process, a planning level cost-benefit review of each action was also considered, in accordance with the requirements of the Disaster Mitigation Act. Quantitative cost-benefit analysis will be considered in additional detail when seeking FEMA mitigation grant funding for eligible projects identified in this plan. Planning Team members also weighed the pros and cons of proposed actions based on their judgement, subject matter expertise and experience with local hazards.

Keeping the STAPLEE criteria in mind, the planning team prioritized the mitigation actions by giving an indication of relative priority, which was then translated into high, medium, and low. The results of the STAPLEE evaluation process produced prioritized mitigation actions for implementation within the planning area. During the plan update, the HMPC identified several mitigation actions that were ongoing or incomplete projects to be carried forward from the 2020 HMP. Priority levels on these actions were revisited and, in some cases, modified to reflect current priorities based on the STAPLEE principles.

5.4 Mitigation Action Plan

This section outlines the development of the mitigation action plan. The action plan consists of the specific projects, or actions, designed to meet the plan's goals. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals.

5.4.1 Progress on Previous Mitigation Actions

As part of the update process the HMPC reviewed the previously identified actions to assess progress on implementation. These reviews were completed using worksheets to capture information on each action including if the action was completed or deferred to the future. Actions that were not completed were discussed for continued relevance and were either continued in the Plan or in some cases recommended for deletion.

The jurisdictions of Region 8 have been working steadily towards meeting the plan’s goals and completing the identified mitigation actions. While several remain to be completed, many were noted as in-progress. Progress on mitigation actions previously identified in the 2020 HMP are detailed in the mitigation action strategy in Section 5.4. Reasons that some actions have not been completed include low priority, lack of funding, or lack of administrative resources.

As of December 2024, there have been 32 actions completed in Region 8, demonstrating significant progress in implementing mitigation actions and reducing community vulnerability to hazards. One action, concerning creating a more efficient creek flow for Flat Creek, was deleted as existing rock weirs in the creek were all removed., The table below summarizes progress implementing mitigation actions for Region 8, inclusive of the municipalities and special districts.

Table 5-1 Completed and Deleted Actions

JURISDICTION	ACTION NAME & DESCRIPTION	HAZARD(S) MITIGATED	STATUS
Teton County	Levee Maintenance Stockpile Facility. Will provide a location for stockpiling of materials for levee maintenance and repair for Teton County and the Army Corps of Engineers.	Dam/Levee Incident, Flood	Completed.
Teton County	Renovate West Bank/ Wilson Fire Station #2. Enhance response and fire fighter safety	Wildfire	Completed. New roof installed.
Teton County	Teton Idaho/Wyoming Mutual Aid Agreement. Develop a mutual aid agreement between the Teton County Wyoming and Teton County Idaho Boards of County Commission for the sharing of resources during emergencies and combined training/exercises to increase disaster resiliency.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed in September of 2023
Teton County	Alta Stateline Rd Bridge. Puts a bridge where one has been missing for decades. Will now provide alternate emergency evacuation route for residents of North Alta without having to go out to Highway 33. completion Fall 2019.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed.
Teton County	WiRē Community Wildfire Risk Assessment. Work with WiRē to conduct wildfire risk assessment and analysis for various communities. Assessment includes rapid windshield survey of community, followed by research-based survey of community members. Use results to develop improved strategies for communicating risk and preparedness to the public	Wildfire	Completed. Information from assessment feeding into current CWPP update.

JURISDICTION	ACTION NAME & DESCRIPTION	HAZARD(S) MITIGATED	STATUS
Teton County	County web camera network. Develop network of web cameras in strategic locations around Teton County to Allow the EOC, Dispatch Centers, and first responders to monitor roads, wildfires, critical infrastructure, and other incidents remotely.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed. ArcGIS web map created with publicly-accessible web cams on it for first responder use. Also installed tower-mounted webcams at EOC for views across valley and of S Highway 89.
Teton County	Hoback Outdoor Warning Siren Upgrade. Upgraded outdoor warning siren install to replace broken old siren at Hoback. New siren has higher decibel level and modern design to Allow for better coverage. Can be used for severe weather, wildfire, hazardous materials spills, and more	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed. Installed June 2019.
Teton County	Gros Ventre Bank Stabilization. Will protect the pathway along N. Hwy 89 on the Gros Ventre River, as well as the pathway bridge and highway bridge across the Gros Ventre.	Flood	Completed in Fall 2019
Teton County	Avalanche Response Equipment Deployment to first responders. TCSO Deputies and Wyoming Highway Patrol Trooper have been issues avalanche beacons, and probes and will also be receiving training on their use. Would like to consider getting same for JHFEMS BCs, ambulances, and first-outs	Avalanche	Completed.
Town of Jackson	START fuel station. Provides continuous fuel service to buses and other emergency/core services fleet vehicles, ensuring core municipal service provision in times of disaster	Avalanche, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed.
Town of Jackson	Snow King Estates water line. New installations and upgrades to water supply infrastructure to ensure service to all residents in the area and sufficient pressure for firefighting	Drought, Wildfire	Completed.
Town of Jackson	Outdoor Warning Siren - Central Jackson. Outdoor warning sirens	Avalanche, Dam/Levee Incident, Drought,	Deleted. Combined with C&T-11.

JURISDICTION	ACTION NAME & DESCRIPTION	HAZARD(S) MITIGATED	STATUS
	can be used to alert the public to wildfire evacuations, severe weather, hazardous materials incidents, terrorist incidents, and more. Coverage is lacking in central Jackson, east Jackson, and Alta.	Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	
Town of Jackson	Outdoor Warning Siren - East Jackson. Outdoor warning sirens can be used to alert the public to wildfire evacuations, severe weather, hazardous materials incidents, terrorist incidents, and more. Coverage is lacking in central Jackson, east Jackson, and Alta.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Deleted. Combined with C&T-11.
Jackson Hole Airport	Fuel Facility and Rental Car Facility Generator. Installed Backup Generator for 100% Coverage of these facilities	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed.
Town of Jackson	Fleet maintenance facility. Ensures emergency and core public services fleets are in good state of repair so that they are able to respond in hazard or emergency situations; provides state of-the-art management of necessary hazardous materials	Avalanche, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed in 2024.
Town of Jackson	Stormwater Treatment Units on Powderhorn Lane. This unit provides protection to Flat Creek by removing dirt, sand, gravel, rocks from entering creek	Flood	Completed, Constructed 2019
Town of Jackson	Purchase of New Street Sweeper. New Sweeper will replace our old sweeper that is at the end of its life. This New sweeper will remove sand, silt, dust, rocks, and gravel from the roadway and prevent it from entering waterways, causing sedimentation and increased flooding	Flood	Completed.
Town of Jackson	Purchase of All Electric START Buses. To provide alternative fuel transportation (electric) to provide redundancy against diesel shortages	Avalanche, Earthquake, Flood, Severe Summer Weather, Severe Winter Weather, Landslide,	Completed. Electric START buses purchased; however, bankruptcy of supplier has caused

JURISDICTION	ACTION NAME & DESCRIPTION	HAZARD(S) MITIGATED	STATUS
		Tornado/Windstorm, Wildfire	maintenance and implementation issues.
Town of Jackson	Purchase of New Loader. To replace aging front-end loader to assist in snowstorm mitigation and flood fight	Severe Winter Weather, Flood	Completed.
Town of Jackson	Town of Jackson Public Works Shop Generator. The Town of Jackson has a new Public Works Shop where vehicle maintenance takes place for town, county, non-profit, and even some federal vehicles. This includes emergency response vehicles and critical public works equipment such as graders and snowplows. This new shop is co-located with the START Bus public transit facility. Generators are being installed to power baseline emergency functions, but both of these facilities need to operate during long-term power outages in order to provide fuel and service to emergency vehicles and to transport the public during evacuations. A more robust generator system is needed to power the entire facility.	Earthquake, High winds & Downbursts, Landslides (include Rockfall/Debris Flos), severe summer weather (lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	Completed.
Town of Jackson	Tree removal. Arborists/forester to determine health of old trees in town and if one is deemed unsafe (high risk of Falling), it is removed and replaced with a young tree	Avalanche, Earthquake, Flood, Severe Summer Weather, Severe Winter Weather, Landslide, Tornado/Windstorm, Wildfire	Deleted. Action was combined with action TJ-3.
Town of Jackson	North King Street Extension. To provide alternative traffic routes to hospital in case of hazards preventing traffic around the town square	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	Completed.
Town of Jackson	Replacement of Motor Graders and Additional Front-End Loaders. To replace aging equipment used in landslide, winter storm, and flood mitigation	Flood, Landslide, Severe Winter Weather	Completed.

JURISDICTION	ACTION NAME & DESCRIPTION	HAZARD(S) MITIGATED	STATUS
Teton County, Town of Jackson	Lightning Safety Signage. Hang Lightning Safety Awareness signs from the National Weather Service in parks and along the pathways to educate the public on how to recognize dangerous lightning situations and get to safety	Lightning	Completed. Installed at all local parks and entrances to bike pathway system.
Teton County, Town of Jackson	WUI Coordinator Position. Explore the creation of a Wildland Urban Interface coordinator position to manage WUI mitigation projects, head up education of the public for WUI issues, and assist with assessments	Wildfire	Completed. Position created in JH Fire/EMS.
Teton County, Town of Jackson	WYDEQ Continuous Fine Particulate Matter monitoring station. WYDEQ is planning on installing a continuous fine particulate matter monitoring station at the sewage transfer station east of JH High School. This would Allow for real - time monitoring of air quality, including wildfire smoke.	Wildfire	Completed. Instruments are owned and operated by WYDEQ. TCD is emergency site operator.
Teton County, Town of Jackson	Hazard tree mitigation. Staff inspects Parks and Town Core annually to identify hazard trees for removal or maintenance. Currently establishing zones throughout the County of rotating inspections for public trees. Public Safety/Power Outage/Torna do/High wind initiative.	Avalanche, Earthquake, Flood, Severe Summer Weather, Severe Winter Weather, Landslide, Tornado/Windstorm, Wildfire	Deleted. Combined with Action TJ-3
Teton Conservation District	Work with Flat Creek Water Improvement District (FCWID) to prevent flooding from frazil ice. Finalize development of WID. Develop a fund for mitigation work, obtain access, implement. Mitigate repetitive property loss and damage from ice-jam flooding.	Flood	Completed.
Teton Conservation District	Cooperate with WY Water Improvement Study for Upper Snake River drainage. Prevent flood potential. Protect lives and property.	Flood	Completed. Assuming this is the irrigation facility risk assessment. We participated but nothing identified formally because they only engage

JURISDICTION	ACTION NAME & DESCRIPTION	HAZARD(S) MITIGATED	STATUS
			with Irrigation Districts.
Teton Conservation District	Conduct flood risk analysis for Flat Creek. Prevent flood potential. Protect lives and property.	Flood	Completed. Flat Creek flood return interval was adjusted during the Lockhart Project.
Flat Creek WID	Flat Creek Watershed Improvement District (FCWID). Formulation of Emergency Wintertime & Spring Runoff Action Plan. Emergency Wintertime & Spring Runoff Action Plan has been provided to FCWID District Members for the last four years to assist property owners on Flat Creek with preparations and ideas for mitigating flooding that may occur on their properties.	Flood	Completed.
Flat Creek WID	FCWID - Wintertime Data Collection and Oversight on Flat Creek. Engagement of Alder Environmental LLC-perform wintertime data collection on Flat Creek has assisted the FCWID in sending that data for analysis to Drs. Kempema & Ettema for studies & reports; offered professional oversight for wintertime flooding mitigation.	Flood	Completed.
Flat Creek WID	FCWID Access Agreements developed and obtained from district members. two access agreements (1-data collection; 2-emergency mitigation) developed with legal counsel to obtain legal permission from District Members. Helpful during wintertime flooding emergencies for track hoe entrance into Flat Creek to protect properties	Flood	Completed.
Flat Creek WID	FCWID Removal of Shoal in Flat Creek upstream of Smith's Market. In concert with FCWID, the Town of Jackson removed the identified constricting shoal	Flood	Completed.

JURISDICTION	ACTION NAME & DESCRIPTION	HAZARD(S) MITIGATED	STATUS
	in Flat Creek upstream of Smith's Market.		
Flat Creek WID	FCWID Bank Stabilization on Flat Creek @ S. Hwy 89 upstream of Smith's Market. WYDOT at the urging of FCWID, shored up eroding Hwy 89 embankment on Flat Creek upstream of Smith's Market; oversight and help by Town of Jackson & Alder Environmental (acting as paid agent of FCWID); installed riprap to stabilize eroding creek bank.	Flood	Completed.
Flat Creek WID	FCWID - Existing ROCK WEIRS Removal/Reconfiguration to Create More Efficient Creek Flow. FCWID "wish list". Acquire expertise to determine which, if any, ROCK WEIRS need to be removed/recon figured to create more efficient creek flow to Alleviate possible flooding.	Flood	Deleted. All in-stream rock weirs (with the exception of the diversion structure for irrigation purposes at the upstream end of Garaman Park) have been removed.
Flat Creek WID	FCWID - Studies & Reports by Dr. Edward Kempema & Dr. Robert Ettema re: Mitigation of Flooding on Flat Creek. Engagement of Drs. Kempema & Ettema to develop analysis of Flat Creek flooding challenges facilitated important mitigation suggestions for various choke areas on the creek that cause winter flooding.	Flood	Completed.

5.4.2 2025 Mitigation Actions

The action plan presents the recommendations developed by the county planning team, outlining how the Region can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The Region is not obligated by this document to implement any or all of these projects. Rather, this mitigation strategy represents the desires of the community to mitigate the risks and vulnerabilities from identified hazards. The Region also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to their overall goals, as listed in this plan.

The table below includes a summary of the numbers of actions completed, continued, and new actions developed for each of the participating jurisdictions in the 2025-2030 HMP. The

HMPC reviewed proposed mitigation actions and determined that TJ-10 should be combined with TJ-3 to address overlapping objectives. Also, the HMPC noted that TJ-15 and TJ-16 of previous mitigation actions should be combined to C&T-11 because this action should only be noted in the County and Town actions. Combining these actions helps enhance efficiency, streamline implementation, and reduce redundancy.

There are a total of 49 actions from the 2020 HMP being continued, along with 24 new actions developed, for a total of 73 actions in the 2025 Region 8 HMP mitigation strategy. For tracking purposes, it is important to note that the Flat Creek Watershed Improvement District (FCWID) and Jackson Hole Airport were not adopting participants in the 2020 HMP. The four continuing actions for FCWID were originally listed as Teton Conservation District actions, and the one continuing action for Jackson Hole Airport was originally noted as a County and Town joint action. These actions are now listed under the correct participating jurisdictions along with new actions for 2025.

Table 5-2 Summary of Actions by Jurisdiction

JURISDICTION	2020 ACTIONS	COMPLETED	DELETED	CONTINUING	NEW ACTIONS 2025	TOTAL NEW AND CONTINUING ACTIONS
County	**33**	9	0	26	0	**26**
Town of Jackson	**28**	11	3	13	7	**20**
County + Town	**7**	3	1	2	11	**13**
Teton Conservation District	**18**	7	1	3	1	**4**
FCWID	**-**	-	-	4	0	**4**
Airport	**-**	-	-	1	5	**6**
Totals	**86**	**30**	**5**	**49**	**24**	**73**

The mitigation actions developed for the plan update are detailed in Table 5-3. Many of the action items included in this plan are a collaborative effort among local, state, and federal agencies and stakeholders in the planning area. The projects are organized by jurisdiction and include notes about the department and partners necessary to implement the project, estimated cost, potential funding sources, timeline, and their relative level of priority: high, medium, and low. The lead agency responsible for each action has been bolded.

The Cost Estimate column describes the estimated project costs using the following categories:

- Little to no cost
- Low: Less than $10,000
- Moderate: $10,000-$100,000
- High: $100,000-$1,000,000
- Very High: More than $1,000,000

The Timeline column describes the estimated time of completion for each project using the following categories:

- Short Term: 1-2 years
- Medium Term: 3-5 years
- Long Term: 5+ years

- Ongoing: action is implemented every year

The tables also provide status/implementation notes that describe progress made on the actions so far, using the following categories, and, where applicable, notes if there were changes in the priority level from the previous plan:

- **Not Started**: Work has not begun.
- **In Progress**: Work has begun but not completed.
- **Continuous**: Ongoing annually with no specific end date.
- **New in 2025:** The action is new to this plan update; little to no work has been completed.

Table 5-3. Teton County Hazard Mitigation Actions

ID	JURISDICTION	ASSOCIATED GOAL(S)	ACTION TITLE AND DESCRIPTION	HAZARD(S) MITIGATED	LEAD AGENCY AND PARTNERS	TIMELINE	COST ESTIMATE AND POTENTIAL FUNDING	PRIORITY	STATUS/IMPLEMENTATION NOTES
TC-1	Teton County	Goals 1 and 2	Upgrade Hoback Fire Station #3. Enhance response and fire fighter safety	Wildfire	**JH Fire/EMS**; ESF#04-Firefighting	Long Term	Moderate; USDA Community Facilities Direct Loan & Grant Program	Low	In Progress. Still in planning phases depending on strategic direction of JH Fire/EMS. Funds have been secured through SPET and become available winter 2025. Design and build to follow.
TC-2	Teton County	Goals 1 and 2	Upgrade Fire Station #4 at Moran Junction. Enhance response and fire fighter safety	Wildfire	**JH Fire/EMS**; ESF#04-Firefighting	Long Term	Moderate; USDA Community Facilities Direct Loan & Grant Program	Low	Not Started.
TC-3	Teton County	Goal 4	Offer one CERT basic training course/year to raise awareness of hazards and increase response capability. Offer monthly ongoing training to CERT volunteers.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TCEM**, Teton County CERT	Ongoing	Moderate; Emergency Management Performance Grant Program (EMPG)	High	Annual Implementation. One basic training offered each year in the fall with monthly trainings for CERT volunteers.

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TC-4	Teton County	Goals 1 and 2	Renovate Teton Pines Fire Station #6. Enhance response and fire fighter safety	Wildfire	**JH Fire/EMS**; ESF#04-Firefighting	Long Term	Moderate; USDA	Low	In Progress. In planning phases.
TC-5	Teton County	Goals 1 and 4	Outreach to encourage public sign-up with Teton_ WY Alerts powered by Everbridge, FEMA phone app and raise awareness of Emergency Alert System, Wireless Emergency Alerts, and NOAA Weather Radio. Citizens warned and better-informed during disasters	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TCEM**	Ongoing	Moderate; County General Funds	High	Annual Implementation. Have recently switched from Nixle to Everbridge. Has required additional outreach efforts and increased cost. Increasing to $5,000 to $25,000.
TC-6	Teton County	Goals 1 and 4	Develop and run general preparedness public service announcements to enable individuals better able to help themselves	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TCEM**	Ongoing	Moderate; County General Funds	High	Annual Implementation. Media campaign created that includes newspaper, online ads, and radio ads for monthly preparedness themes all year long.
TC-7	Teton County	Goals 1 and 4	Improve emergency management website to update preparedness outreach and provide emergency information to the public. Individuals better able to prepare and provide	Avalanche, Dam/Levee Incident, Drought, Earthquake,	**TCEM**	Short Term	Moderate; County General Funds	Medium	In Progress. ArcGIS Online solution for a public information website is being configured but has

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			reliable source of emergency information during incidents	Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire					not been deployed. ArcGIS Emergency Management Hub solution implemented for TCIncident.org emergency information website. Non-emergency info side of website needs a complete rewrite.
TC-8	Teton County	Goals 1 and 4	Work with rural subdivisions at risk for flood and wildland fire to develop their own plans. Reduce potential for loss of lives.	Flood, Wildfire	**TCEM, JH Fire/EMS, TC Sheriff**; TC Floodplain Administrator	Ongoing	Low; EMPG, BRIC, Community Planning Assistance for Wildfire (CPAW)	Medium	In Progress. WUI Coordinator is working with subdivisions on their wildfire preparedness plans. Draft EOP update includes a new section with guidance to the general public on creating community emergency plans.
TC-9	Teton County	Goals 1 and 2	Map critical facilities with back-up power. Obtain/ install generators for those without. Enhanced response, sheltering, and continuity of government	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather,	**TCEM**, Teton County School District, American Red Cross, **Teton County Facilities Division**, Teton County Library, ESF#12-Energy	Short Term	Moderate; EMPG, BRIC	Medium	In Progress. TCEM has started to map critical infrastructure in the community using ArcGIS Emergency Management Solution. Several facilities, including the Teton County Library – Jackson and

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				Tornado/Windstorm, Wildfire					Teton County Library – Alta branches have been identified as needing generators to serve as disaster recovery centers, warming shelters, clean air shelters, and cooling shelters. Once completed, next step will be to identify those without emergency power that need it.
TC-10	Teton County	Goal 4	Integrate hazard information into County GIS and make available to the public through County website. Prevent future property damage by ensuring development doesn't occur in hazard areas	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	TOJ Planner; TC Planner; TC Engineer; TCEM; WOHS Coordinator, WY State Geological Survey; **TC GIS Administrator**	Short Term	Low; County General Funds, Staff Time	Medium	In Progress. County has recently hired a GIS Administrator. They are bringing various hazard information online and making available to the public.
TC-11	Teton County	Goal 2	Critical Facility Generator Hookups. Assess EOC power needs and install external hook-ups for a trailer-mounted generator to be installed on the EOC in the event the primary generator fails.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide,	TCEM; TCSO; JHFEMS; TCHD; TC Library; **Teton County Facilities**	Short Term	Low; State Homeland Security Program (EMPG/SHSP) Grant	Low	Not Started.

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				Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire					
TC-12	Teton County	Goals 1 and 4	Critical Facility Command Trailer Hookups. In the event the county EOC becomes unusable, or needs additional workspace for a long-term disaster, install hookups on the outside of the building to provide power, internet, and phone to trailer command posts that may come to assist.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TCEM**; TCSO; JHFEMS; TCHD; TC Library; **Teton County Facilities**	Short Term	Low; EMPG, SHSP	Low	Not Started.
TC-13	Teton County	Goals 1 and 4	Outdoor Warning Siren -- Alta and Grand Targhee Resort. Outdoor warning sirens can be used to alert the public to wildfire evacuations, severe weather, hazardous materials incidents, terrorist incidents, and more. Coverage is lacking in central Jackson, east Jackson, Grand Targhee Resort, and Alta.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TCEM**; Community of Alta, Grand Targhee Resort	Short Term	Low; EMPG, BRIC	Low	Not Started.

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TC-14	Teton County	Goals 1 and 4	Update 'quake island' mapping of county, make available on GIS. Enhance response, Ability to better plan ahead	Earthquake	**TC GIS Administrator,** TCEM, Geologists of JH	Medium Term	Moderate; County General Funds, Staff Time, Non-profit assistance	Medium	Not Started. County now has a GIS Administrator. Will be working with him to get this project started.
TC-15	Teton County	Goal 2	Rank bridges based on quake island analysis. Perform structural retrofitting of vulnerable bridges. Improve resilience of the county's transportation system	Earthquake	FEMA Mitigation Specialist; **WYDOT Engineer, FHWA Engineer**; TC Road and Levee; TOJ Public Works, Geologists of JH, WY State Geological Survey, ESF#01-Transportation	Medium Term	High; County General Funds, BRIC, Wyoming DOT Funding	Medium	Not Started.
TC-16	Teton County and Teton Conservation District	Goal 4	Use HMP and the Great ShakeOut as a platform to raise awareness and encourage individual responsibility and action. Reduced potential for property damage, business interruption. Teton Conservation District to serve as a participant and promoter of the Great ShakeOut.	Earthquake	**TCEM,** TCD staff	Ongoing	Little to no cost; Staff Time, Local General Funds	Low	Annual Implementation. TCEM participates in the Great Wyoming ShakeOut every October and conducts public outreach on earthquake preparedness.

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TC-17	Teton County	Goal 1	Identify redundant transportation routes for emergency access and evacuation. Develop county-wide evacuation plan with professional traffic models, especially for limited-access subdivisions and critical trans nodes. Reduces potential for loss of life	Earthquake, Flood, Wildfire	**TCEM,** TC Road and Levee; ESF#01-Transportation; Homeowners; TAWPC	Medium Term	High cost; Staff Time, Local General Funds, PROTECT Grant	Medium	In Progress. Teton County applied for a PROTECT grant in the amount of $750,000 to hire a contractor to complete a traffic analysis and develop an evacuation plan for the entire county. Application was denied, but County will try to apply again.
TC-18	Teton County	Goal 4	Complete work to participate in the NFIP Community Rating System. Reduce effects of flood events; lower insurance rates for property owners in the floodplain	Flood	TC Engineer; TCEM; **WOHS Floodplain Coordinator; TC Floodplain Administrator; TOJ Floodplain Administrator**	Ongoing	Little to no cost; Staff Time, Local General Funds	Low	Not Started. Not much interest from participating jurisdictions. Very few flood insurance policies in place that would benefit.
TC-19	Teton County	Goal 4	Reinstitute automated dam monitoring and alert notification, Jackson Lake Dam. Provide greater response time. Reduce potential for loss of life and property damage	Dam/Levee Incident, Flood	TC Commissioners; National Park Service; **US Bureau of Reclamation**	Short Term	Moderate; County General Funds, Wyoming Safety of Dams Funding	Low	Not Started. Outside of purview of local government.
TC-20	Teton County	Goal 4	Offer 1-2 weather spotter and/or CoCoRaHS courses/year. Raised awareness, better data	Flood, Severe Summer Weather, Severe Winter Weather	**TCEM**; NWS Riverton Warning Coordination Meteorologist	Ongoing	Low; Staff time, EMPG	Medium	Annual Implementation. Continue to offer Weather Spotter and CoCoRaHS each year.

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TC-21	Teton County	Goal 3	EOC Weed Control. Control weed grasses and other fine fuels surrounding the County EOC to help mitigate against wildfire, especially around generator and HVAC systems.	Wildfire	TCEM; **Teton County Parks & Recreation**	Ongoing	Low; Staff time, BRIC	Low	Annual Implementation.
TC-22	Teton County	Goal 2	County Network Redundancy. Increase resilience of data and internet network of critical County facilities through backup data services	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TC Information Technology,** TCEM; TCSO; JHFEMS; TCHD; TC Library; Teton County Facilities	Long Term	High; Wyoming SHSP	Medium	In Progress. TCIT is working on redesigning county network to allow several internet access points to serve as backups to buildings throughout the network. EOC installed a cellular backup internet router for FirstNet, and Frontline, and Starlink. EOC also has budgeted funds for FY25 to install Star Link backup internet at EOC.
TC-23	Teton County	Goal 1	Spring Gulch Rd Avalanche Mitigation. Examine possible solutions to avalanche path on Spring Gulch Rd, just north of Highway 22. Implement steps to mitigate against avalanches that could cause loss of life, property damage, or closure of road.	Avalanche	**TC Road & Levee**; TC Engineering; ESF#01-Transportation; ESF#03-Public Works	Long Term	High; BRIC	Medium	Not Started.
TC-24	Teton County	Goals 1, 2, and 3	Water supply analysis. Analyze Teton County to determine areas that are not within a safe distance from a water source for firefighting. Look at population	Drought, Wildfire	**Jackson Hole Fire/EMS**; TAWPC; Teton Conservation	Short Term	Moderate; BLM-WUI Community Fire	High	In Progress. Will need to get more info from WUI Coordinator to

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			density, vegetation, wildfire history, and water sources. Use data to determine if supplemental water systems are needed.		District; ESF#04-Firefighting; ESF#11-Agriculture & Natural Resources		Assistance Funds		understand progress on this project.
TC-25	Teton County	Goals 2 and 3	Winter sand/salt storage dome. Provides designated, covered location to store sand/salt for winter roadways maintenance, allowing for larger quantities on-hand; containment of material reduces pollution contributions to surface waters	Severe Winter Weather, Flood	ESF#03-**County Public Works**	Medium Term	High; Local General Funds	High	Not Started.
TC-26	Teton County	Goals 1 and 2	Snow storage/melting facility. Enhances road safety by providing a larger location to store and/or melt snow so that more can be removed from streets, increasing traffic safety and providing clear routes for evacuation. Strategic melting can also be used for groundwater recharge for drought resiliency.	Severe Winter Weather, Drought	**County Public Works**; ESF#01-Transportation; ESF#03-Public Works	Short Term	High; CIP, Local General Funds	Medium	Not Started.
TJ-1	Town of Jackson	Goal 4	Consider natural hazards when creating/updating community development plans. This is to include mitigation actions, data, and overall goals. Risk reduction is incorporated at the community level.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather,	TC Planner; TOJ Planner; TOJ **Town Council**; Town of Jackson Floodplain Administrator; County Commission; County Floodplain Administrator	Ongoing	Little to no cost; Staff Time, Local General Funds	High	Annual Implementation.

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				Tornado/Windstorm, Wildfire					
TJ-2	Town of Jackson	Goal 2	Rank bridges based on quake island analysis. Perform structural retrofitting of vulnerable bridges. Improve resilience of the Town's transportation system	Earthquake	**TOJ Public Works**; WYDOT; ESF#01-Transportation; FEMA Mitigation Specialist; WYDOT Engineer, FHWA Engineer; TC Road and Levee; Geologists of JH; WY State Geological Survey,		Moderate; CIP, State DOT Funds, BRIC	Low	Not Started. Will put into the Capital Planning Document
TJ-3	Town of Jackson, FCWID, Teton County	Associated goals 2 and 3	Continue the Town of Jackson's hazard tree reduction program and expand to include County and FCWID. Arborists/foresters determine health of old trees in town and if one is deemed unsafe (high risk of Falling), it is removed and replaced with a young tree. Limit the secondary effects of severe weather (wind, snow). Currently establishing zones throughout the County of rotating inspections for public trees. Public	Avalanche, Earthquake, Flood, Severe Summer Weather, Severe Winter Weather, Landslide, Tornado/Windstorm, Wildfire, Severe Winter	**TC Parks and Recreation**; TC Parks & Recreation, TOJ Public Works; ESF#11-Agriculture & Natural Resources, County Public	Ongoing	Little to no cost; Staff Time, Local General Funds	Medium	Annual Implementation. ongoing every year

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			Safety/Power Outage/Tornado/High wind initiative. FCWID to support and promote the program in areas along the pathways near Flat Creek that would require tree management by Parks/Rec.	Weather, Tornado/Windstorm	Works, FCWID Chair				
TJ-4	Town of Jackson	Goal 2	Upgrade to Public Works Communication Tower. Update equipment for All Public Works communication via truck radios and office radios. Ensure interoperability with other first response agencies	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TOJ Public Works;** Teton County Wireless Radio Coordinator; ESF#02-Communications	Short Term	High; DHS SAFECOM Emergency Communication Grant	High	Not Started. Looking to implement in FY25 or FY26
TJ-5	Town of Jackson	Goals 2, 3, and 4	Town of Jackson Stormwater Management Program. Reduce pollution contributions from stormwater runoff to improve surface water quality and prevent natural protection systems degradation; also reduce localized flooding and winter creek freeze/flooding	Drought, Flood, Severe Summer Weather, Severe Winter Weather	**TOJ Public Works**; ESF#03-Public Works	Short Term	Moderate; Funding already secured	High	In Progress. Should be completed in 2025/2026.
TJ-6	Town of Jackson	Goal 2 and 3	Snow melt spoils management. Provides space for spreading/drying and testing dirt remaining after the winter snow pile melts, to determine whether it can be beneficially reused as fill material or must be disposed; reduces pollution to protect surface water and groundwater quality	Severe Winter Weather, Drought	**TOJ Public Works**; ESF#03-Public Works; County Public Works	Short Term	Moderate; Local General Funds/Local Agreement	Medium	Not Started.

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TJ-7	Town of Jackson	Goal 1	Roadway intersections and streetscapes improvements. Accommodates peak-demand traffic periods, improves traffic flow efficiency, and provides multiple transport modes throughout town to reduce potential for hazards and congestion during evacuations for any type of disaster	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TOJ Public Works**; WYDOT; ESF#03-Public Works; ESF#01-Transportation	Medium Term	Very High; CIP/Local & State General Funds	Medium	Not Started. Projects are completed annually to support alternate modes, but not specifically to address evacuation. Some other overarching plans/projects are in progress (joint Town/County).
TJ-8	Town of Jackson	Goal 4	Streetlight additions to enhance public safety through better visibility (prevents accidents with other users and wildlife) and provides safe routes during evacuation	Wildfire	**TOJ Public Works**; Lower Valley Energy; ESF#01-Transportation; ESF#03-Public Works;	Medium Term	High; CIP/Local General Funds	Medium	In Progress. Ongoing yearly
TJ-9	Town of Jackson	Goal 4	Land Development Regulation updates. Review and update land development regulations to provide public safety and reduce impacts of flood, drought, fire, avalanche, landslide, and other hazards	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**TOJ Planning**, County Planning	Ongoing	Moderate; Staff Time, FMA, BRIC	Medium	Annual Implementation.

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TJ-10	Town of Jackson	Goal 3	Stormwater Treatment Unit Installation HWY 89. To reduce inflow of grit, sand, rock, gravel into Flat Creek	Flood	**TOJ Public Works;** Teton Conservation District; ESF#03- Public Works	Medium Term	Moderate; EPA Grants	Medium	Not Started. Project has a placeholder in capital plan
TJ-11	Town of Jackson	Goal 3	Future Stormwater Catchment Units. To install stormwater catchment units to further protect infiltration of sand, silt, gravel, and rock into Flat Creek.	Flood	**TOJ Public Works**; Teton Conservation District; #03- Public Works	Medium Term	Moderate; EPA Grants	Medium	In Progress. Ongoing and added with new projects as they come
TJ-12	Town of Jackson	Goal 2	Cache Creek Tube. Replaces old stormwater conveyance system through Town, additionally making it easier to maintain and move sections out from under existing buildings to public access	Flood	**TOJ Public Works**; Teton Conservation District; ESF#03- Public Works	Long Term	Moderate; BRIC	High	In Progress. Some sections have been completed, ongoing for other portions
TJ-13	Town of Jackson	Goal 2	Secure Land and Build a New Potable Water Tank. To add capacity to our potable water system that will Allow for redundancy and backup to other water zones in town. Other zones could be harmed or damaged from power outages or earthquakes. This will allow greater water capacity to feed other zones.	Earthquake, Drought, Wildfire	**TOJ Public Works**; ESF#03- Public Works	Medium Term	Very High; Wyoming Dept. of Environmental Quality Drinking Water State Revolving Fund	Medium	In Progress. ongoing - evaluating site alternatives for zone 3.
TJ-14	Town of Jackson	Goal 2	Generators for public buildings and municipal facilities. Town Public Works' Facilities Division oversees installation and regular inspections and maintenance for generators at Town owned buildings and facilities. Several buildings do not currently have backup power sources, and the Town aims to	Earthquake, Flood, High Winds & Downbursts, Severe Summer Weather (Lightning, Extreme Heat,	**Town Public Works Department**; possibly Lower Valley Energy, Energy Conservation Works	Annual Implementation	High; BRIC, Hazard Mitigation Grant Program (HMGP)	Medium	New in 2025

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			install generators or other similar backup supply, prioritizing those associated with critical utilities, critical services, and sheltering locations. Having backup power in place ensures continuation of services when the primary power system fails and enables effective crisis management and emergency response by having utility and building/facility resources available. The Town currently needs to add generators or other backup power sources to 3 water supply system facilities (a booster station and 2 wells), and 3 wastewater lift stations. Other locations include an Administration building, a public restroom facility that could serve as a shelter/gather location, and a multi-unit housing structure.	Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire					
TJ-15	Town of Jackson	Goals 1 and 2	Resiliency Hub Planning and Development. Resiliency Hubs provide a safe place for people to go to seek relief from extreme weather and other conditions. They differ from Emergency Shelters, which are usually open for short durations after an extreme event such as a flood, tornado, or fire. Resiliency Hubs can be designed to be longer term, and to provide relief on an ongoing basis for conditions that persist and may return season after season, such as extreme heat or wildfire smoke. They should be locations with access to air purification, heat, and air conditioning at a minimum, along with backup power sources. They could also have facilities for bathing,	Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold)	**Town of Jackson Public Works**	Medium Term	High; BRIC, HMGP; There could be federal funding available for climate resiliency planning	Medium	New in 2025

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			cooking, or sleeping, and double as emergency shelters when reprieve is needed for longer than a few hours. Resiliency hubs can be created out of existing facilities such as recreation centers, senior centers, libraries, and other public spaces. They may need additional infrastructure and backup power. The creation of a new space is also possible.						
TJ-16	Town of Jackson	Goal 2	Town of Jackson Town Hall Annex Generator. Jackson Town Hall at 150 E Pearl Ave has outgrown its office space. The Town has acquired the Geittmann, Larson, and Swift law office building across the street and plans on moving some offices to this building. Town hall is critical to the ongoing operation of public services ranging from police to building inspections to legal. This newly acquired building does not have any power backup to allow it to carry out critical municipal functions during a power outage. A generator is needed to power the entire facility.	Earthquake, High Winds & Downbursts, Landslide (incl Rockfall/Debris Flow), Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	**Town of Jackson Public Works**	Short Term	Very High; Town of Jackson Capital Funds, BRIC, HMGP	Medium	New in 2025
TJ-17	Town of Jackson	Goal 2	Utility facilities repair and maintenance. Perform regular maintenance on structures that house water supply and wastewater treatment utility infrastructure and operations. The Town owns the following assets: Water supply: 10 wells, 5 well houses (plus 1 future addition in progress), 3 booster stations, 3 storage tanks (plus 1 future addition).	Drought, Hazardous Materials, Landslide (incl Rockfall/Debris Flow), Severe Summer Weather, Severe Winter	**Town Public Works**, Town IT	Annual Implementation	High; Town of Jackson Capital Funds,	Medium	New in 2025

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			Wastewater: 1 headworks and pumping building, 10 lagoons, 1 UV disinfection building, 7 lift stations/pump houses, 3 PV solar systems, some separate structures for backup power. The Town also utilizes a SCADA system for data tracking and remote operations for both utilities. Routine maintenance like repairing and replacing building components (such as siding, entrances, and roofs) as well as system components (such as bar screens, pumps, and valves) extends the life and maintains security of these systems. It also improves resiliency in service provision. Regular, effective asset management reduces overall costs which in turn prevents larger increases in user rates.	Weather, Wildfire					
TJ-18	Town of Jackson	Goals 1, 2, and 3	Green Infrastructure projects. The Town is currently developing a Stormwater Management Program. One part of the program involves establishing or updating policies and requirements related to water quantity and quality of stormwater runoff from construction sites and from developed properties. As part of this effort, the Town will also design and implement three green infrastructure pilot projects to test different practices/technologies for effectiveness in our local environment. Once policies are established and effective practices are identified, other green infrastructure projects will be implemented throughout Town to aid in	Dam/Levee Incident, Drought, Flood, Landslide (incl Rockfall/Debris Flow), Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Wildfire	**Town Public Works**; Town Planning & Buildings, Parks and Recreation, Teton Conservation District	Medium Term	Moderate; Clean Water Act section 319 funds (administered through WY DEQ); BRIC	Low	New in 2025

ID	JURISDICTION	ASSOCIATED GOAL(S)	ACTION TITLE AND DESCRIPTION	HAZARD(S) MITIGATED	LEAD AGENCY AND PARTNERS	TIMELINE	COST ESTIMATE AND POTENTIAL FUNDING	PRIORITY	STATUS/IMPLEMENTATION NOTES
			flood prevention and protect water quality in our creeks that serve as Snake River headwaters. In addition to provide stormwater storage and management areas, green infrastructure also helps prevent landslides by stabilizing natural slopes, helps prevent wildfire by retaining more moisture in areas distributed through town, and provides areas for snow storage and melting.						
TJ-19	Town of Jackson	Goal 2	Bury urban power lines. Several street corridors in town have overhead power lines, and both the Town and Lower Valley Energy (LVE, the power utility provider in town) desire to bury them. Burying power lines reduces risk of fire, danger to wildlife, and other electricity related hazards where overhead lines may fall, break, become entangled with trees, or reduce clearance access to buildings and construction activities. Additionally, buried power lines are less susceptible to damage and outages in windstorms, snow/ice storms, and wildfires. The Town has worked with LVE and private property developments and redevelopments to bury power lines, with an emphasis on the Town Square and downtown core as highest priorities. These projects have mostly been opportunistic due to annual limitations on capital improvement project funding.	Drought, High Winds & Downbursts, Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms) , Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	Public Works; **Lower Valley Energy (LVE)**, WYDOT, Fire/EMS, Parks & Recreation	Long Term	High; BRIC, Town/LVE Patronage Funds	Low	New in 2025

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TJ-20	Town of Jackson	Goals 1 and 2	Enhance and construct roofs for snow mitigation at public facilities. The Town owns multiple public buildings, municipal operations facilities, and residential units/properties. Protecting public facilities and operations enables the Town to provide continuous service during periods of heavy snowfall and accumulation which is present throughout our long winters. The Town prioritizes structures that house critical utilities and services, or that can serve as a sheltering location in a crisis. Currently the Town has identified 1 public building that is overdue for full roof replacement and can serve as a crisis shelter, and one administrative building needing mitigation for snow dams and icicles that present hazards. Additionally, the Town performs roof repairs and replacements. Annual review of the capital improvement plan and assets help identify immediate and short term retrofit/replacement needs.	Severe Winter Weather (incl Extreme Cold)	**Town Public Works;** Town Administration, Town Finance	Long Term	High; BRIC	High	New in 2025
C&T-1	Teton County, Town of Jackson	Goal 2	Natural Gas Emergency Flow Valves. As of 4/17/19, All natural gas mains are required to have an Emergency Flow Valve (EFV). This is installed by Lower Valley Energy on their main, and if there is a break between the main and the meter it will stop flow. This is NOT an earthquake valve.	Avalanche, Drought, Earthquake, Flood, Landslide, Severe Summer Weather, Severe Winter Weather,	**Lower Valley Energy**; ESF#12-Energy, Teton County Public Works, TOJ Public Works	Ongoing	High; BRIC, Lower Valley Energy CIP	Medium	Annual Implementation.

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				Tornado/Windstorm, Wildfire					
C&T-2	Teton County, Town of Jackson, FCWID	Goal 4	Teton Wildfire Ambassador Program. Train and work with neighborhood ambassadors to become champions for wildfire mitigation in their neighborhood. Have them reach out to neighbors, be examples of good mitigation practices, and be a liaison with emergency services. FCWID to support in promoting program.	Wildfire	**TAWPC**; TOJ Community Engagement, ESF#04 – Firefighting, FCWID Chair	Medium Term	Little to no cost; Staff Time, Local General Funds	High	Annual Implementation. Ongoing program supported by TAWPC
C&T-3	Teton County, WYDOT, Town of Jackson	Goals 1 and 2	Transportation Emergency Alternatives Management (TEAM). When an emergency occurs, many residents and commuters may find themselves struggling to find appropriate transportation alternatives to get where they need to go. The recent landslide which closed Teton pass for nearly one month is an example where commuters were forced to travel longer distances or find temporary housing solutions. Transportation alternatives can include programs including but not limited to 1) A network of park-and-rides to facilitate transit use, thereby limiting traffic on diverted corridors (as increased traffic can	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Hazardous Materials, High Winds & Downbursts, Landslide (incl Rockfall/Debris Flow), Severe Summer Weather (Lightning,	**Teton County Emergency Management,** Regional Transportation Planning Administrator; Town Ecosystem Stewardship Administrator; County Sustainability Coordinator; ESF#01 – Transportation;	Medium Term	High; CMAQ, 5311, PROTECT, other grants	Medium	New in 2025

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			lead to increased crashes and reduced safety overall). 2) Shared mobility options such as car-sharing, carpooling or vanpooling to facilitate pooling through restricted areas that may need to operate at lower speeds or with limited traffic. 3) Real-time customer information to facilitate better decision making about current conditions	Extreme Heat, Thunderstorms) , Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	Partner w/ Local govts. And employers				
C&T-4	Teton County, Town of Jackson	Goal 2	Good Samaritan Mission Emergency Shelter Generator. Good Samaritan Mission (GSM) provides emergency and extended shelter to those experiencing personal emergencies or impacted by natural disasters. Currently, GSM has no backup power for power loss caused by weather, natural disasters, electrical grid disruptions or other means creating a closure of Teton County's only Emergency Shelter. Emergency generator power allows GSM to also be part of Teton County's Disaster-Pandemic relief response.	Earthquake, Flood, High Winds & Downbursts, Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms) , Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	**Good Samaritan Mission**, Teton County Emergency Management, TOJ Public Works	Short Term	High; Internal GSM Fundraising, BRIC. Site Determination work and Building Permit: $10,000. Site Preparation: Demolition/removal of the deck at the proposed location and build cement pad. $40,000. Install electric and gas lines and their generator connection lines. $20,000. 60KW Commercial Generator: $25,000	High	New in 2025

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							(Includes Shipping) Contingency: $5,000		
C&T-5	Teton County, Town of Jackson, EAS Broadcasters	Goal 2	Teton County/Jackson EAS Station Generators. Teton County and the Town of Jackson have relatively few local media outlets, and no local television stations. The Emergency Alert System (EAS), although old, is reliable and still relevant in the age of Wireless Emergency Alerts and cell phones. Since it relies on broadcast technologies, it does not have the bandwidth issues that cellular infrastructure may have. It is also accessible by anyone with an AM/FM radio, NOAA All Hazards Weather Radio, or cable television. Our local EAS broadcasters must be able to operate when a disaster strikes, and power is impacted. This includes both their broadcast locations and their transmitters. This project would provide for design and installation of backup power equipment for broadcast locations and/or transmitters, with ongoing maintenance of the generators being the responsibility of the broadcaster.	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Hazardous Materials, High Winds & Downbursts, Landslide (incl Rockfall/Debris Flow), Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	**EAS Broadcasters;** Teton County Emergency Management, TOJ Community Engagement and Police	Long Term	Very High; EAS Broadcaster Funds, BRIC	Low	New in 2025

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C&T-6	Teton County, Town of Jackson	Goal 2	Teton County/Jackson EOC Power Resiliency. Teton County/Jackson EOC currently has a generator that powers the entire facility and the neighboring Coroner's Office and morgue, and a UPS that covers most outlets and HVAC components in the facility. However, the generator is not considered a Level 1 generator that would normally be required for a critical facility because it is missing an auxiliary generator power bypass, and its fuel tank is only 200 gallons. This project would add the necessary components to make the generator a Level 1 generator that would power not only the EOC, but also the Coroner's Office/morgue, and the Adams Canyon Fire Station which are all located at the same campus. This may include a installing a larger fuel tank, adding a larger dual-fuel generator (diesel and natural gas), installing an auxiliary generator bypass, and integrating existing solar panels on the facility for added energy resilience.	Earthquake, High Winds & Downbursts, Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	**Teton County Emergency Management**, Teton County Facilities Management, Jackson Hole Fire/EMS, Teton County Coroner, TOJ Public Works	Medium Term	Very High; Teton County and Town of Jackson Capital Funds, BRIC	Medium	New in 2025
C&T-7	Teton County, Town of Jackson, FCWID	Goals 1 and 3	Teton County/Jackson Geologic Hazard Mapping. Teton County, the Town of Jackson, and the Flat Creek Watershed Improvement District are impacted on an annual basis by various geologic hazards ranging from landslides impacting major highways like South Highway 89 in the Snake River Canyon, avalanches off of East Gros Ventre Butte that dam up Flat	Avalanche, Landslide (incl Rockfall/Debris Flow), Earthquake	**Teton County GIS Services;** Teton County Emergency Management, TOJ Public Works, FCWID Chair	Short Term	Moderate; Teton County Capital Funds, BRIC	High	New in 2025

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			Creek causing flooding, and of course earthquakes. This project would entail designing an RFI, retaining a contractor, and developing a thorough geologic hazard map and analysis for Teton County to include: Avalanche paths along transportation corridors and populated areas with names, risk rating, and mitigation recommendations. Landslide areas near transportation corridors and populated areas with names, risk rating, and mitigation recommendations. Fault lines of concern with risk rating, potential magnitude, and mitigation recommendations. A map showing worst-case scenarios for the highest potential magnitude earthquake in the County showing "islands", or areas of the County that may become isolated due to damaged bridges/roads, landslides, and avalanches. Where possible, identifying and mapping socially vulnerable populations within the mapped "islands"						
C&T-8	Teton County, Town of Jackson	Goal 2	Teton County/Jackson Library Generators. Teton County and the Town of Jackson have very few public buildings compared to other local governments. This is partly due to the limited space (97% of the county is Federal land) and cost. For this reason, finding adequate spaces for warming/cooling shelters, cleaner air	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Hazardous Materials, High	**Teton County Library;** Teton County Emergency Management, TOJ Community Engagement	Medium Term	Very High; Teton County Library Capital Funds, BRIC	High	New in 2025

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			shelters, evacuee reception centers, family assistance center, or a disaster recovery center can be difficult. Teton County Library Jackson and Alta branches have both been identified as primary locations for these functions due to their location, usable space, parking, bilingual resources, and trust they have built with the community. Unfortunately, neither facility has power backup, and in the event of a power outage (which may be a reason they are activated for one of the above functions) the facilities would be unusable. This project would be for the design and installation of adequate power backup at each of these facilities so they can operate during a power outage.	Winds & Downbursts, Landslide (incl Rockfall/Debris Flow), Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire					
C&T-9	Teton County, Town of Jackson	Goal 4	Teton County/Jackson Public Education and Outreach. Teton County Emergency Management has been building its public education and outreach around the hazards highlighted in the Region 8 Hazard Mitigation Plan for several years. These efforts have included a monthly preparedness calendar, monthly preparedness themes with accompanying newspaper and radio ad spots, interviews for local newspaper articles and radio stories on hazard preparedness, participation in the Great Wyoming ShakeOut, National Preparedness Month contests, and our CERT program. This project would sustain these programs, plus build on them to	Avalanche, Dam/Levee Incident, Drought, Earthquake, Flood, Hazardous Materials, High Winds & Downbursts, Landslide (incl Rockfall/Debris Flow), Severe Summer Weather (Lightning, Extreme Heat,	**Teton County Emergency Management.** TOJ Community Engagement	Annual Implementation	Moderate; Teton County Capital Funds, BRIC	High	New in 2025

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			create further outreach through social media ad spots, retaining services to overhaul the Teton County Emergency Management website, and other public outreach efforts around hazard mitigation and preparedness.	Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire					
C&T-10	Teton County, Town of Jackson	Goal 1 and 4	Teton County/Jackson Outdoor Warning Siren System Expansion. Teton County and the Town of Jackson have an outdoor warning siren system consisting of 7 sirens situated near populated areas in the town and county. These sirens are used for all hazards, meaning we only use a single 3-minute wail for alerting for hazards that could have a significant impact to people that are outdoors near the sirens. Currently there are significant outdoor warning siren system coverage gaps in the population centers of central Jackson, east Jackson, Alta, and Grand Targhee Resort. This project would include the planning, installation, and configuration of outdoor warning sirens to cover these areas.	Dam/Levee Incident, Earthquake, Flood, Hazardous Materials, High Winds & Downbursts, Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	**Teton County Emergency Management,** TOJ Police	Medium Term	Very High; Teton County and Town of Jackson Capital Funds, BRIC	Medium	New in 2025
C&T-11	Teton County, Town of Jackson	Goal 1 and 4	Teton County/Jackson Outdoor Warning Siren System Maintenance. Teton County and the Town of Jackson have an outdoor warning siren system consisting of 7 sirens situated near populated areas in the town and county. These sirens are used for all hazards, meaning we only use a single 3-minute wail for alerting for hazards that could have a significant impact to people that are outdoors near	Dam/Levee Incident, Earthquake, Flood, Hazardous Materials, High Winds & Downbursts, Severe Summer Weather	**Teton County Emergency Management,** TOJ Police	Annual Implementation	Moderate; Teton County Capital Funds	High	New in 2025

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			the sirens. These systems require routine annual maintenance to ensure they are functioning when needed during an emergency. This project addresses their annual upkeep and maintenance costs.	(Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire					
C&T-12	Teton County, Town of Jackson		"Go Bag" Giveaway – Work with schools, senior center, One22 Resource Center, and public at large for distribution of "Go Bags" to help with preparedness for evacuation and hazard awareness. Create canvas shopping-style bags branded with TCEM and preparedness info printed on the outside. Include in the bag branded AM/FM/Weather radio, branded 14-day pill boxes, branded waterproof document pouch with cut sheet of important documents, branded large refrigerator magnet with preparedness info, and 6 copies of family communication plan template on heavy card stock.	Dam/Levee Incident, Earthquake, Flood, Hazardous Materials, High Winds & Downbursts, Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire	**Teton County Emergency Management,** TOJ Community Engagement	Annual Implementation	Low; Teton County budgetary funds, BRIC, HMGP	Medium	New in 2025
C&T-13	Teton County, Town of Jackson		County Watchdesk - Teton county doesn't have the staff for a dedicated watch desk to monitor weather, social media, the Web, the dark web, geologic activity, and local public safety activity 24/7, but this is needed for early detection and warning to mitigate against all hazards listed in the mitigation plan. An AI powered	Dam/Levee Incident, Earthquake, Flood, Hazardous Materials, High Winds & Downbursts,	**Teton County Emergency Management**	Annual Implementation	Medium; Teton County budgetary funds, BRIC, HMGP, SHSP	Medium	New in 2025

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			monitoring tool that can keep track of all of these sources and notify appropriate personnel is necessary.	Severe Summer Weather (Lightning, Extreme Heat, Thunderstorms), Severe Winter Weather (incl Extreme Cold), Tornado/Windstorm, Wildfire					
TCD-1	Teton Conservation District	Goal 4	Educate residents about benefits of purchasing flood insurance. Enable economic recovery from flooding.	Flood	**Teton Conservation District staff,** TC Emergency Management and Public Works	Ongoing	Low; Staff Time, Local General Funds	Low	Annual Implementation. Occurs each spring with monthly public outreach themes. TCD has not participated in this to a large extent.
TCD-2	Teton Conservation District	Goals 1 and 4	Fire fuel reduction; provide education, assessments, and resources to public for fuel reduction projects. Lowered effects of fire in the wildland urban interface.	Wildfire	**Teton Conservation District**; Teton Area Wildfire Protection Coalition; Jackson Hole Fire/EMS; ESF#04-Firefighting; ESF#11-Agriculture & Natural Resources	Ongoing	Moderate; Wyoming State Forestry Division, USDA, NRCS	High	Annual Implementation. Conducted by both TCD and WUI Coordinator on a regular basis.

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TCD-3	Teton Conservation District	Goals 1, 2, and 3	Cheatgrass mapping and mitigation. Map invasive plants, including cheatgrass, that contribute to wildfire risk. Mitigate invasive wildfire hazard plants using industry best-practices	Wildfire	**Teton County Weed & Pest District**; **Teton Conservation District Land Resource Specialist;** TAWPC; ESF#11-Agriculture & Natural Resources	Ongoing	Moderate; USDA National Invasive Species Information Center	Medium	In Progress. TCD has partnered with Teton County Weed and Pest and Jackson Hole Weed Management Association for this.
TCD-4	Teton Conservation District	Goals 1, 2, and 3	Highway 390 Living Snow Fence at "Windy Mile". Reduce impacts to road in winter, such as plowing, accidents, visibility; There are no snow fences in the County.	Drought Severe Winter Weather (incl Extreme Cold), Windstorm	**WYDOT**, WY State Forestry Division, **Teton Conservation District Land Resource Specialist**, private landowner, WY Office of State Lands and Investments	Medium Term	Moderate; WSFD - Living Snow Fence, TCD Funds	Medium	New in 2025
FCWID-1	Flat Creek WID	Goals 1 and 4	FCWID supporting district members flood mitigation via recommended long-term mitigation efforts (building berms, landscaping, assistance with permitting process if required). The FCWID is actively researching potential measures to be taken by District members to reduce impact of flooding events with intention of supporting long-term private property mitigation efforts.	Flood	**Flat Creek Water Improvement District Chair**; ESF#11-Agriculture & Natural Resources	Long Term	Low; Staff Time, Local General Funds	Medium	In Progress.

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FCWID-2	Flat Creek WID	Goals 2 and 3	FCWID Wort Ditch Diversion Engineering & Design of New Irrigation Head Gate Diversion. Annually implement the long-term protocol of removing rock weir at Wort Ditch diversion point in Garaman Park area of creek during the fall. The Rock weir obstructs creek flow and contributes to ice dams and flooding. Re-erect the diversion structure in Flat Creek each year during the spring.	Flood, Severe Winter Storm	**Flat Creek Water Improvement District Chair**; ESF#11-Agriculture & Natural Resources	Ongoing	Low; Staff Time, Local General Funds	Low	Annual Implementation. The district has chosen to terminate this project due to high projected construction costs. Instead, the district has for the last two years simply taken down the diversion dam (rock weir) in the creek in the fall and reestablished it in the spring. This is a much more cost-effective course of action. Therefore, this mitigation action could either be deleted or revised to reflect the district's current (and anticipated long-term) protocol. The funds utilized to take down and re-erect the diversion structure in Flat Creek each year is drawn from the district's own funds.

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FCWID-3	Flat Creek WID	Goals 2 and 4	FCWID Installation of additional thaw wells on Flat Creek to mitigate winter flooding. This project is a component of creating an active ice management system that minimizes ice volume in Flat Creek will minimize winter flooding as impact of severe winter weather; exploring possible installation of two more thaw wells (one at 810 West, and a second at Elk Run Townhomes). The thaw wells pump groundwater into the creek bed to help reduce the buildup of frazil ice on the river bottom. The system has potential to augment streamflows during drought to reduce impacts to aquatic life.	Flood, Drought, Severe Winter Storm	**Flat Creek Water Improvement District Chair**; TOJ Public Works; ESF#03-Public Works; ESF#11-Agriculture & Natural Resources	Short Term	High; TCD, FCWID, COVID Declaration Hazard Mitigation Grant Program	High	In Progress. the TCD is the lead agency, and the primary funding ($504,000) is being provided by a FEMA Hazard Mitigation Grant Program issued by the Wyoming Office of Homeland Security. 10% matching funding is being provided by the TCD and the FCWID (spilt equally between the two local entities).
FCWID-4	Flat Creek WID	Goal 3 and 4	Investigate the Need for and Appropriateness of Expansion of the Current FCWID District. FCWID "wish list"-Considerations for expanding the current FCWID District boundaries to include All Flat Creek properties adjacent to the creek from Elk Refuge TOJ border south to where the creek enters the Snake River.	Flood	**Flat Creek Water Improvement District Chair**; Teton Conservation District; ESF#11-Agriculture & Natural Resources	Ongoing	Low; Staff Time, Local General Funds	Medium	In Progress.
JAC-1	Jackson Hole Airport	Goal 1 and 2	Jackson Hole Airport - Stormwater Filtration System. Stormwater Filtration System has the capability of handling a 100-year event and will then release at a standard rate.	Flood	**JH Airport Operations**; ESF#03 -Public Works	Long Term	Very High; Federal Aviation Administration (FAA) Airfield Improvement Program (AIP)	High	In Progress. Although completed, Airport needs to expand capacity of project. Is looking for mitigation funding to assist.

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JAC-2	Jackson Hole Airport	Goal 1 and 2	Total Airport Facilities - Emergency Generator. Instead of Individual Generators - Install High Voltage Generator on Incoming Circuit - Similar to Jails and other Critical Infrastructure	Dam/Levee Incident, Drought, Earthquake, Flood, Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm, Wildfire	**Jackson Hole Airport Operations**; ESF#12- Energy	Short Term	High; Federal Aviation Administration (FAA) Airfield Improvement Program (AIP), Airport CIP Funds	Medium	New in 2025
JAC-3	Jackson Hole Airport	Goal 1 and 2	Airport Perimeter Fencing - Critical Infrastructure. Perimeter Fence could be improved to provide hazard mitigation	Flood, Severe Summer Weather, Severe Winter Weather, Wildfire	**Jackson Hole Airport Operations**	Short Term	High; Federal Aviation Administration (FAA) Airfield Improvement Program (AIP), Airport CIP Funds	Medium	New in 2025
JAC-4	Jackson Hole Airport	Goal 1 and 2	Aviation Safety Facility. Aviation Safety Facility - Some facilities don't have fire suppression, lightning protection, built to previous code, etc.	Earthquake, Severe Summer Weather, Wildfire	**Jackson Hole Airport Operations**	Medium Term	Very High; Federal Aviation Administration (FAA) Airfield Improvement Program (AIP)	High	New in 2025
JAC-5	Jackson Hole Airport	Goal 1, 2 and 3	Solar parking lot canopy. Covered parking for severe weather and power support	Severe Summer Weather, Severe Winter Weather	**Jackson Hole Airport Operations**	Medium Term	Moderate; Federal Aviation Administration (FAA) Airfield Improvement Program (AIP), Airport CIP Funds	Low	New in 2025

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JAC-6	Jackson Hole Airport	Goal 1 and 2	Alert and warning system. Alert/Warn airport staff of severe weather in order to mitigate from its impacts	Severe Summer Weather, Severe Winter Weather, Tornado/Windstorm	**Jackson Hole Airport Operations**	Medium Term	Moderate; Federal Aviation Administration (FAA) Airfield Improvement Program (AIP), Airport CIP Funds	Low	New in 2025

6 Adoption, Implementation, and Maintenance

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the regional plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement. The system for implementation and maintenance was reviewed during the 2024 update and largely stays the same as the process detailed in the 2020 plan.

6.1 Formal Plan Adoption and Responsible Parties

The purpose of formally adopting this HMP is to secure support from all participants in this Region 8 HMP. The governing board for each participating jurisdiction has adopted this local hazard mitigation plan by passing a resolution. A copy of the generic resolution and the executed copies are included in Appendix B, Plan Adoption. This plan will be updated and re-adopted every five years in concurrence with the required Disaster Mitigation Act local plan update requirements.

The Teton County Board of County Commissioners in cooperation with the Town of Jackson Council and the Teton Conservation District Board of Supervisors, Flat Creek Watershed Improvement District Board, and the Jackson Hole Airport Board are responsible for ensuring that the HMP is kept current. With adoption of the plan, the responsible officials designate the Teton County Emergency Management Coordinator, with the assistance of the LEPC, as the lead in accomplishing the on-going responsibilities. The role of the LEPC in implementation and maintenance includes:

- Acting as a forum for hazard mitigation issues;
- Disseminating hazard mitigation ideas and activities to all participants;
- Pursuing the implementation of high-priority, low/no-cost recommended actions;
- Keeping the concept of mitigation in the forefront of community decision-making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Maintaining a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitoring and assisting in implementation and update of this plan;
- Reporting on plan progress and recommended changes to the County Commissioners; and
- Informing and soliciting input from the public.

6.2 Implementation of Mitigation Actions

Once updated and adopted, this Plan is intended to be implemented so that Teton County and the participating jurisdictions' vulnerability to natural hazards will be reduced over time. While this plan contains many worthwhile mitigation actions, the Emergency Management Coordinator and LEPC will need to decide which action(s) to undertake first. Two factors will help with making that decision:

6. The priority assigned to actions identified in the planning process, and
7. The availability of funding.

Low or no-cost projects can sometimes most easily demonstrate progress toward successful plan implementation.

Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective benefits of each project to the community and its stakeholders. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe and sustainable community.

Simultaneous to these efforts, the Emergency Management Coordinator and LEPC will constantly monitor funding opportunities that could be leveraged to implement some of the more costly actions. This will include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the County and participating jurisdictions will then be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, special district budgeted funds, state and federal earmarked funds, and other grant programs, including those that can serve or support multi-objective projects.

6.3 Integration into Existing Plans and Procedures

Another important implementation mechanism that is highly effective and low-cost is incorporating the hazard mitigation plan recommendations and their underlying principles into other jurisdictional plans and mechanisms. Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation through existing plans and/or programs is recommended, wherever possible.

Based on this plan's updated capability assessment, the participating jurisdictions have and continue to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous, related planning efforts and mitigation programs, and recommends implementing projects, where possible, through these other program mechanisms. The 2020 Region 8 Hazard Mitigation Plan is already referenced in the county/town All Hazards Recovery Plan and Emergency Operations Plan. The 2020 Region 8 HMP is also referenced in the 2024 Community Wildfire Protection Plan (CWPP), that includes the County, Town of Jackson and Teton Conservation District. TCEM has leveraged the HMP in outreach efforts as a reference for the general public to better understand potential hazards and relative risk to help them in their preparedness planning. TCEM has used the mitigation plan in capital improvement plan requests. Additional existing planning mechanisms include the following that cover all the participating jurisdictions:

- 2020 Jackson/Teton County Comprehensive Plan
- 2025 Jackson/Teton County Capital Improvement Plan
- Jackson/Teton County All Hazards Recovery Plan
- Jackson/Teton County Emergency Operations Plan
- 2024 Community Wildfire Protection Plan (CWPP) – County, Jackson, Teton Conservation District
- 2022 Jackson/Teton County Hazardous Materials Emergency Response Plan
- 2022 Jackson/Teton County All Hazards Recovery Plan
- 2019 Flat Creek Water Improvement District Wintertime and Spring Runoff Action Plan
- 2024 Town of Jackson Sustainability Plan
- Town of Jackson and Teton County Land Development Regulations
- Teton Conservation District Wildfire Risk Reduction Program
- Jackson Hole Airport Capital Improvements Plan annual updates
- Local Emergency Planning Committee (LEPC)

LEPC members involved in the updates to these mechanisms will be responsible for integrating the findings and recommendations of this plan with these other plans, as appropriate. The plan will be considered a core document that links to other related planning mechanisms, which will build from the information and recommendations contained herein. In addition to the plan, web-based platforms have been created for use and dissemination of hazard data and risk assessment results and for tracking of mitigation actions that LEPC, other jurisdictional staff, and the public can use to implement the Mitigation Strategy. In order to ensure the concepts and actions identified in this plan integrate into the plans listed above as well as other local planning efforts, LEPC members will take the following steps and bring forward at all LEPC meetings any strategic actions necessary to implement these steps:

1. Monitor all planning efforts underway at the jurisdictional, regional, and state level, including those originating from or involving the Teton County or Town of Jackson Planning & Building departments and other local agencies;
2. Determine the necessary links between those efforts and the content of this plan, including but not limited to Mitigation Strategy goals, risk assessment results, hazards, assets, and potential funding sources;
3. Participate in ongoing and future planning efforts, contribute content from the mitigation plan, and ensure proper reference is made to the mitigation plan; and
4. Promote awareness of the mitigation plan to increase opportunities for collaboration and integration of plan content.

The Emergency Management Coordinator is responsible for updating a number of emergency management related plans. He has been directly involved in this update and will coordinate development of those plans consistent with this NHMP.

6.4 Plan Maintenance and Evaluation Process

Plan maintenance is an ongoing effort to monitor and evaluate plan implementation, its effectiveness, and to update the plan as required or as progress, roadblocks, or changing circumstances are recognized.

This plan will be updated, approved and adopted within a five-year cycle as per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000. The County will inquire with the Wyoming Office of Homeland Security (WOHS) and FEMA for funds or technical assistance to assist with the update. Funding sources may include the Emergency Management Performance Grants, Building Resilient Infrastructure and Communities, Hazard Mitigation Grant Program (if a presidential disaster has been declared), or other grant funds. The Teton County Emergency Management Coordinator is responsible for initiating and facilitating the plan update process.

In order to track progress and update the mitigation strategies identified in the action plan, the LEPC will revisit this plan annually or after a significant hazard event or disaster declaration has occurred. The Teton County Emergency Management Coordinator is responsible for initiating this review and working with the LEPC Chair to convene members of the LEPC on a once yearly basis, or more frequently as needed. The LEPC meeting in July will be used to review the HMP. The LEPC will discuss the following questions pertaining to the effectiveness and implementation status of the plan:

- Have any potential hazards developed that were not addressed in the plan?
- Have any natural disasters occurred that were not addressed in the plan?
- Has any unanticipated development occurred that is vulnerable to hazards?
- Are there any additional mitigation ideas that need to be incorporated?
- Have projects been initiated and/or completed?
- What are the barriers to completing projects identified in the plan?

A representative from the responsible office identified in each mitigation action will be responsible for tracking and reporting on an annual basis to the department lead on action status and provide input on whether the action, as implemented, meets the defined objectives and is likely to be successful in reducing vulnerabilities.

Evaluation is used not only to measure progress, but to evaluate the effectiveness of the plan itself and if goals are being achieved. Changes will be made to the plan to accommodate for actions that were not successful or were not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation.

6.5 Continuing Public Participation

Continued public involvement is imperative to the overall success of the plan's implementation. The update process provides an opportunity to publicize success stories from the plan's implementation and seek additional public comment. A public hearing(s) to receive public comment on plan maintenance and updating will be held during the update period. When the LEPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process, including those that joined the committee since the planning process began, to update and revise the plan. The plan maintenance and update process will include continued public and stakeholder involvement and input through participation in designated committee meetings, LEPC meetings, social media postings, government website postings, other notification systems, and press releases to local media.

In addition to the procedures for including the public in the five-year updates described above, to ensure the public will have the opportunity to remain involved in the implementation and annual updates of the plan, the following will take place:

- The Teton County Emergency Management Coordinator will provide a brief annual summary report to the governing bodies on what has been accomplished during the previous year and to receive guidance from the elected officials on their priorities for the coming year.
- Each year following the July LEPC meeting called for the purpose of reviewing the status of the plan, Emergency Management will make information available to the public on the accomplishments of the previous year and allow comment for any revisions.

Teton County is home to an active and engaged citizenry. Many of these individuals have professional credentials in fields related to hazard mitigation planning. The Geologists of Jackson Hole are an example of a group with tremendous local expertise. During subsequent updates, the county may choose to more deeply investigate certain hazards as new information becomes available.

APPENDIX A: PLANNING PROCESS DOCUMENTATION

Note: This appendix provides documentation of the plan update process during the 2024-2025 update timeframe.

Project Backgrounder
Regional Hazard Mitigation Plan Update

Wyoming all-hazards emergency management Region 8 consists of Teton County, Town of Jackson and Teton Conservation District. The Region is updating the 2020 Regional Hazard Mitigation Plan in collaboration with local municipalities, special districts, and other stakeholders. This plan develops community mitigation strategies, to work towards reducing the risks posed by hazards. The plan must be updated and approved by FEMA every five years to keep it current and to maintain eligibility for mitigation grant assistance.

What is hazard mitigation?

The term "Hazard Mitigation" describes actions that can help reduce or eliminate long-term risks caused by hazards, such as floods, wildfires, tornadoes, and earthquakes. Hazard mitigation is best accomplished when based on a comprehensive, long-term plan developed before a disaster strikes.

As the costs of disaster impacts continue to rise, governments and citizens must find ways to reduce hazard risks to our communities. Oftentimes after disasters, repairs and reconstruction are often completed in such a way as to simply restore damaged property to pre-disaster conditions. These efforts may "get things back to normal," but the replication of pre-disaster conditions often results in a repetitive cycle of damage, reconstruction, and repeated damage.

Hazard mitigation breaks this repetitive cycle by producing less vulnerable conditions through pre- and post-disaster actions and projects. The implementation of such hazard mitigation actions by state and local governments will lead to more resilient communities and reducedinjuries and damages in the future.

Project Benefits

Mitigation is an investment in a community's future safety and sustainability. Recent cost-benefit studies have proven mitigation to be cost effective for communities, with mitigation projects returning on average $6 for every $1 spent. Mitigation planning helps communities identify and prioritize actions that can be taken before a disaster or hazard event, to reduce impacts when they occur.

Hazard mitigation planning helps local governments and other stakeholders think through how to plan, design, build, and establish partnerships for risk reduction. Public, private and non-profit stakeholders are important partners. Consider the critical importance of mitigation to:

- Protect public safety and prevent loss of life and injury.
- Reduce harm to existing and future development.
- Maintain community continuity and strengthen the social connections that are essential for recovery.
- Prevent damage to your community's unique economic, cultural, and environmental assets.
- Minimize operational downtime and accelerate recovery of government and business after disasters.
- Reduce the costs of disaster response and recovery and the exposure to risk for first responders.
- Help accomplish other community objectives, such as capital improvements, infrastructure protection, open space preservation, and economic resiliency.

Additionally, participating local government jurisdictions that adopt the plan will benefit from this project by:

- **Ensuring eligibility for all sources of hazard mitigation funds made available through FEMA.**
- **Increasing public awareness and understanding of vulnerabilities as well as support for specific actions to reduce losses from future disasters.**
- **Ensuring community policies, programs, and goals are compatible with reducing vulnerability to all hazards and identifying those that are incompatible.**
- **Building partnerships with diverse stakeholders, increasing opportunities to leverage data and resources in reducing workloads, as well as achieving shared community objectives.**
- **Expanding the understanding of potential risk reduction measures to include: local plans and regulations; structure and infrastructure projects; natural systems protection; education and awareness programs; and other tools.**
- **Informing the development, prioritization, and implementation of mitigation projects. Benefits accrue over the life of these projects as losses are avoided from each subsequent hazard event.**

How to Get Involved:

The plan update process is an opportunity for new stakeholders and local governments to participate in the process. Local governments can include certain special districts. Teton County, with assistance from a Wyoming Office of Homeland Security-procured consultant, will be organizing the effort in early 2024. Residents, organizations, and businesses are also encouraged to contribute to the planning process. Over the next few months, the County and participating jurisdictions will reach out to the public for input on hazards and their mitigation through a short, online survey. Public input is important to developing an actionable plan that reflects community priorities, and there will be additional opportunity for public input before the updated plan is finalized in late 2024/early 2025.

For more information please contactyour county's Homeland Security Coordinator:
https://hls.wyo.gov/contacts/county-contacts

REGIONAL HAZARD MITIGATION PLAN

FOR PUBLIC COMMENT AND REVIEW

Are you interested in learning more about the most significant natural hazards in our area and what is being done to reduce losses from incidents like floods, wildfires, and winter storms? A draft of the Regional Hazard Mitigation Plan is available for public review and comment through January 31, 2025.

What: Wyoming Region 8 (Teton County) Hazard Mitigation Plan

Why: To assesses risks posed by natural hazards, identify ways to reduce those risks, and allow each participating municipality and special district to be eligible for mitigation grant funding.

How: Access the draft plan and online comment form here: https://hls.wyo.gov/

When: Submit comments by January 31, 2025.

Questions? Contact Teton County Emergency Management at em@tetoncountywy.gov

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APPENDIX B: PLAN ADOPTION AND APPROVAL

Note: The records of adoption will be incorporated as an electronic appendix. When the plan is adopted in 2025, the adoption date will be noted here, but a scanned version of the adoption resolution will be kept on file with the Emergency Manager of each participating jurisdiction in Wyoming Region 8. A sample adoption resolution is provided here. The final FEMA approval packed will be included for future reference regarding the five-year expiration date and suggestions for improvement in the next update.

U.S. Department of Homeland Security
Region 8
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267

FEMA

R8-MT

July 25, 2025

Ashley Paulsrud
Grants/Finance Section Chief
Wyoming Office of Homeland Security
5500 Bishop Boulevard - East Door
Cheyenne, Wyoming 82002

Dear Ms. Paulsrud,

We are pleased to announce the approval of the Wyoming Region 8 Regional Hazard Mitigation Plan as meeting the requirements of the Stafford Act and Title 44 of the Code of Federal Regulations § 201.6 for a local hazard mitigation plan. The plan approval extends to Teton County, the Town of Jackson, and the Districts of Teton Conservation District, Jackson Hole Airport District, and Flat Creek Watershed Improvement District.

Mitigation plans may include additional content to meet Element H: Additional State Requirements or content the local government included beyond applicable FEMA mitigation planning requirements. FEMA approval does not include the review or approval of content that exceeds these applicable FEMA mitigation planning requirements.

The jurisdictions are hereby eligible for FEMA mitigation grant programs. All requests for funding will be evaluated individually according to the specific eligibility and other requirements of the particular programs under which the application is submitted.

The approval period for this plan is from July 25, 2025, through July 24, 2030. A local jurisdiction must revise its plan and resubmit it for approval within five years to continue to be eligible for mitigation project grant funding. We have provided recommendations for the next plan update on the enclosed Plan Review Tool.

We wish to thank the jurisdictions for participating in the process and commend your continued commitment to mitigation planning.

Sincerely,

Nicole M. Aimone
Mitigation Division Director

Enclosure

Local Mitigation Plan Review Tool

Cover Page

The Local Mitigation Plan Review Tool (PRT) demonstrates how the local mitigation plan meets the regulation in 44 CFR § 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the local governments, including special districts.

1. The Multi-Jurisdictional Summary Sheet is a worksheet that is used to document how each jurisdiction met the requirements of the plan elements (Planning Process; Risk Assessment; Mitigation Strategy; Plan Maintenance; Plan Update; and Plan Adoption).
2. The Plan Review Checklist summarizes FEMA's evaluation of whether the plan has addressed all requirements.

For greater clarification of the elements in the Plan Review Checklist, please see Section 4 of this guide. Definitions of the terms and phrases used in the PRT can be found in Appendix E of this guide.

Plan Information	
Jurisdiction(s)	Teton County WY, Town of Jackson, Teton Conservation District, Flat Creek Watershed Improvement District, Jackson Hole Airport District
Title of Plan	Wyoming Region 8 Hazard Mitigation Plan
New Plan or Update	Update
Single- or Multi-Jurisdiction	Multi-jurisdiction
Date of Plan	2025-2030
Local Point of Contact	
Title	Rich Ochs Teton Emergency Management Coordinator
Agency	Teton County Emergency Management
Address	PO Box 4458 Jackson, WY 83001
Phone Number	(307) 413-5040
Email	rochs@tetoncountywy.gov

Additional Point of Contact	
Title	Click or tap here to enter text.
Agency	Click or tap here to enter text.
Address	Click or tap here to enter text.
Phone Number	Click or tap here to enter text.
Email	Click or tap here to enter text.

Review Information	
State Review	
State Reviewer(s) and Title	Click or tap here to enter text.
State Review Date	Click or tap to enter a date.
FEMA Review	
FEMA Reviewer(s) and Title	Ariana Borrello, Community Planner, IR Rob Pressly, Community Planner, QC
Date Received in FEMA Region	2/20/2025
Plan Not Approved	4/14/2025
Plan Approvable Pending Adoption	5/1/2025
Plan Approved	7/25/2025

Multi-Jurisdictional Summary Sheet

In the boxes for each element, mark if the element is met (Y) or not met (N).

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
1	Teton County	Y	Y	Y	Y	Y	Y	N/A	N/A
2	Town of Jackson	Y	Y	Y	Y	Y	Y	N/A	N/A
3	Teton Conservation District	Y	Y	Y	Y	Y	Y	N/A	N/A
4	Flat Creek Watershed Improvement District	Y	Y	Y	Y	Y	Y	N/A	N/A
5	Jackson Hole Airport District	Y	Y	Y	Y	Y	Y	N/A	N/A
6									
7									
8									
9									
10									

Plan Review Checklist

The Plan Review Checklist is completed by FEMA. States and local governments are encouraged, but not required, to use the PRT as a checklist to ensure all requirements have been met prior to submitting the plan for review and approval. The purpose of the checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been "met" or "not met." FEMA completes the "required revisions" summary at the bottom of each element to clearly explain the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is "not met." Sub-elements in each summary should be referenced using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each element and sub-element are described in detail in Section 4: Local Plan Requirements of this guide.

Plan updates must include information from the current planning process.

If some elements of the plan do not require an update, due to minimal or no changes between updates, the plan must document the reasons for that.

Multi-jurisdictional elements must cover information unique to all participating jurisdictions.

Element A: Planning Process

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))		
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan's development, as well as who was involved?	Chapter 3, pg 3-1 to 3-13	Met
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?	Chapter 3, pg 3-1 to 3-7, Appendix A	Met

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process? (Requirement 44 CFR § 201.6(b)(2))		
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?	Chapter 3, pg 3-4 to 3-11, pg 3-13	Met
A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))		
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?	Chapter 3, Section 3.3.1 pg 3-7 to 3-11, Appendix A	Met
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))		
A4-a. Does the plan document what existing plans, studies, reports and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?	Chapter 3, Section 3.3.1 pg 3-11 to 3-12	Met
Element A Required Revisions		
Required Revision**:** Click or tap here to enter text.		

Element B: Risk Assessment

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))		
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	Chapter 4 Section 4.3.1 pg 15.	Met
B1-b. Does the plan include information on the location of each identified hazard?	Chapter 4 Pg 4-14 to 4-132 hazard profiles "Location" subsections	Met
B1-c. Does the plan describe the extent for each identified hazard?	Chapter 4 hazard profiles "Extent (Magnitude)" subsections pg 4-16, 4-27, 4-35, 4-44, 4-61, 4-77, 4-90, 4-102, 4-112, 4-127	Met
B1-d. Does the plan include the history of previous hazard events for each identified hazard?	Chapter 4 hazard profiles Pg 4-14 to 4-132 "Previous Occurrences" subsections	Met
B1-e. Does the plan include the probability of future events for each identified hazard, including the type, location and range of anticipated intensities?	Chapter 4 Pg 4-14 to 4-132 hazard profiles "Probability of Future Events and Climage Change Impacts" subsections	Met
B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?	Chapter 4 pg 4-1 to 4-4; Pg 4-14 to 4-132 Risk Summary subsections for each hazard	Met

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B2. Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))		
B2-a. Does the plan provide an overall summary of each jurisdiction's vulnerability to the identified hazards?	Chapter 4 pg 4-1 to 4-4; Pg 4-14 to 4-132 Vulnerability Assessment and Risk Summary subsections for each hazard	Met
B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?	Chapter 4 pg 4-1 to 4-4; Pg 4-14 to 4-132 Vulnerability Assessment and Risk Summary subsections for each hazard	Met
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?	Chapter 4 pg 4-67	Met
Element B Required Revisions		
Required Revision: Click or tap here to enter text.		

Element C: Mitigation Strategy

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))		
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?	Chapter 2 Section 2.5 pg 2-14 to 2-22	Met
C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?	Chapter 2 Section 2.5.5 pg 2-22 to 2-24	Met
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?	Chapter 2 Section 2.5 pg 2-17 to 2-18	Met
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))		
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?	Chapter 5 pg 5-1 to 5-2	Met
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))		
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?	Chapter 5 pg 5-2 and pg 5-10 to 5-39	Met
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment?	Chapter 5 pg 5-10 to 5-39	Met

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))		
C5-a. Does the plan describe the criteria used for prioritizing actions?	Chapter 5 pg 5-2 to 5-3	Met
C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?	Chapter 5 pg 5-10 to 5-39	Met
Element C Required Revisions		
Required Revision**:**		

Element D: Plan Maintenance

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))		
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?	Chapter 6 Section 6.5 pg 6-4	Met
D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))		
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?	Chapter 6 Section 6.4 pg 6-3 to 6-4	Met

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.	Chapter 6 Sections 6.2 and 6.4 pg 6-1 to 6-4	Met
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?	Chapter 6 Section 6.4 pg 6-3 to 6-4	Met
D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))		
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?	Chapter 6 pg 6-2 to 6-3	Met
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?	Chapter 6 pg 6-2 to 6-3	Met
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?	Chapter 6 pg 6-2 to 6-3	Met

Element D Required Revisions
Required Revision: Click or tap here to enter text.

Element E: Plan Update

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))		
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?	Chapter 2 Section 2.3 pg 2-6 to 2-11 Chapter 4 Pg 4-14 to 4-132 Land Use and Development Trends subsections	Met
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))		
E2-a. Does the plan describe how it was revised due to changes in community priorities?	Chapter 5 pg 5-2 to 5-3, pg 5-10 to 5-39	Met
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?	Chapter 5 pg 5-2 to 5-3, pg 5-10 to 5-39	Met
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?	Chapter 6 pg 6-2	Met
Element E Required Revisions		
Required Revision**:**		

Element F: Plan Adoption

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F1-a. Does the participant include documentation of adoption?	N/A	Choose an item.

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F2-a. Did each participant adopt the plan and provide documentation of that adoption?	Chapter 6 pg 6-1, appendix B	Met
Element F Required Revisions		
Required Revision: Click or tap here to enter text.		

Element G: High Hazard Potential Dams (Optional)

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?		
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?	N/A	Choose an item.
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?	N/A	Choose an item.
HHPD2. Did the plan address HHPDs in the risk assessment?		
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?	N/A	Choose an item.
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?	N/A	Choose an item.
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?		
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?	N/A	Choose an item.
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?	N/A	Choose an item.

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?		
HHPD4-a. Does the plan describe specific actions to address HHPDs?	N/A	Choose an item.
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?	N/A	Choose an item.
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?	N/A	Choose an item.
HHPD Required Revisions		
Required Revision**:** Click or tap here to enter text.		

Element H: Additional State Requirements (Optional)

Element H Requirements	Location in Plan (section and/or page number)	Met / Not Met
This space is for the State to include additional requirements.		
Click or tap here to enter text.	Click or tap here to enter text.	Choose an item.

Plan Assessment

These comments can be used to help guide your annual/regularly scheduled updates and the next plan update.

Element A. Planning Process

State

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

FEMA

Strengths

- Kudos to the planning team for receiving 622 responses to the public survey! It's clear that the planning team put in concerted effort to ensure the public survey reached a large audience and incorporated the feedback intentionally throughout the plan
- The plan update is a good example of incorporating and referencing existing planning documents to strengthen the mitigation plan, especially with respect to the comprehensive plan.
- The involvement and consideration of representatives of a variety of stakeholders representing the community was great to see. This level of stakeholder invitations and involvement shows a thorough effort to engage a wide array of stakeholders that represent the whole community.

Opportunities for Improvement

- While the planning team provided an online public survey and provided the draft plan to the public online, consider including in person events to engage the public for future plan updates. The meeting notes show that a list of public events to consider engaging the public was compiled during the planning process, but there is no mention of engaging the public at any of the events included on the list. Having hard copies of surveys at public events or making planning meetings open to the public can ensure those with limited internet access are included in public engagement.
- Consider inviting large employers in the area to participate in the planning process such as ski resorts, local mining companies, and utility companies.

Element B. Risk Assessment

State

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

FEMA

Strengths

- The hazard risk profiles include great maps, figures, and tables that accurately and clearly define risk, both future potential risk and past events. This level of detailed risk assessment will be useful for implementing mitigation projects and helps to inform a strong mitigation strategy. In particular, the Earthquake HAZUS products, Landslide maps and figures, Flood maps, and Wildfire WUI maps outline risk in visually interesting and understandable ways.

Opportunities for Improvement

- Ensure that hazard significance information stays consistent throughout the plan. For example, Table 4-2 Region 8 Overall Hazard Significance Summary by Jurisdiction shows that the Town of Jackson rates Avalanche as Medium while Table 4-10 Risk Summary by Jurisdiction: Avalanche shows that the Town of Jackson rates Avalanche as High due to 3 entry/exit points to the town being at high risk of cutting off access if an avalanche were to occur.

Element C. Mitigation Strategy

State

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

FEMA

Strengths

- We are pleased to see nearly one third of actions from the previous plan were completed! Jurisdictions are making great progress on mitigating long-term risks and vulnerabilities, and we look forward to seeing further progress in the next plan update.
- The detailed capabilities assessment really helps the reader understand each jurisdiction's strengths and gaps in capacities and capabilities to accomplish hazard mitigation. This is a great assessment to have in place and it provides a solid foundation for future plan updates.

Opportunities for Improvement

- In the next plan update, please include additional specificity for mitigation actions to better demonstrate how they will mitigate risk to each profiled hazard. For example, TJ-9 is a mitigation action to review and update land development regulations to provide public safety and reduce impacts to hazards. A stronger mitigation action would be to include the possible land development regulations to consider and outline how the identified regulations to update reduce risk to each identified hazard. Another example is C&T-9, which is focused on education and outreach. While this action outlines how education and outreach will occur, it would be

strengthened by specifying what education and outreach activities will be included and how they will address risk to each identified hazard.

Element D. Plan Maintenance

State

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

FEMA

Strengths

- The plan includes robust support for integrating the hazard mitigation plan and mitigation actions into other community planning mechanisms. It's clear that local land use development and community decision-making is informed by multiple community planning mechanisms, showing the region's commitment to hazard mitigation and ensuring their communities thoroughly consider their vulnerabilities. Leveraging existing planning processes/projects strengthens all community planning mechanisms, ensures implementation of planning outcomes, and helps identify additional funding opportunities.

Opportunities for Improvement

- In the next plan update, consider including a more granular discussion about the strategic actions the LEPC will take to ensure the HMP is integrated into other local planning mechanisms.

Element E. Plan Update

State

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

FEMA

Strengths

- It is great to see that the previous plan was clearly integrated into important local planning mechanisms, such as the county/town All Hazards Recovery Plan and Emergency Operations Plan and the 2024 Community Wildfire Protection Plan (CWPP). The Changes in Development section highlights progress made towards achieving Complete Neighborhoods across 3 Common Values.

Opportunities for Improvement

- [insert comments]

Element G. HHPD Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element H. Additional State Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

B. Resources for Implementing Your Approved Plan

FEMA Funding Sources

Hazard Mitigation Grant Program (HMGP)

The HMGP is a post-disaster mitigation program. It is made available to states by FEMA after each Federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures. The HMGP can be used to fund cost-effective projects that will protect public or private property in an area covered by a federal disaster declaration or that will reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard prone areas, flood-proofing or elevation to reduce future damage, minor structural improvements and development of state or local standards. Applicants who are eligible for the HMGP are state and local governments, certain nonprofit organizations or institutions that perform essential government services, and Indian tribes and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf. Applications are submitted to your state and placed in rank order for available funding and submitted to FEMA for final approval. Eligible projects not selected for funding are placed in an inactive status and may be considered as additional HMGP funding becomes available.
https://www.fema.gov/grants/mitigation/learn/hazard-mitigation

Public Assistance (PA)

FEMA's Public Assistance Program provides supplemental grants to state, tribal, territorial, and local governments, and certain types of private non-profits so communities can quickly respond to and recover from major disasters or emergencies.

After a disaster event, communities need help to cover their costs for debris removal, life-saving emergency protective measures, and restoring public infrastructure. FEMA also encourages protecting these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.
https://www.fema.gov/assistance/public

Flood Mitigation Assistance (FMA) Grant Program

The Flood Mitigation Assistance grant program is a competitive program that provides funding to state, territory and local governments and federally recognized Tribal Nations. Since the National Flood Insurance Reform Act of 1994 was signed into law, funds are used for projects that reduce or

eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.
https://www.fema.gov/flood-mitigation-assistance-grant-program

Hazard Mitigation Grant Program (HMGP) Post Fire Grant Program

FEMA's Hazard Mitigation Grant Program (HMGP) has Post Fire assistance available to help communities implement hazard mitigation measures after wildfire disasters. States, federally-recognized tribes and territories affected by fires resulting in a Fire Management Assistance Grant (FMAG) declaration on or after October 5, 2018, are eligible to apply.
https://www.fema.gov/grants/mitigation/post-fire

Rehabilitation of High Hazard Potential Dams (HHPD) Grant Program

This program provides technical, planning, design, and construction assistance in the form of grants for rehabilitation of eligible high hazard potential dams, as applicable for eligible jurisdictions. For more information, please visit: https://www.fema.gov/emergency-managers/risk-management/dam-safety/rehabilitation-high-hazard-potential-dams

Publicly Available Tools

FEMA Community Engagement Prioritization Tool (CEPT)

https://www.fema.gov/floodplain-management/manage-risk/community-engagement-prioritization-tool

FEMA Resilience Analysis and Planning Tool (RAPT)

https://www.fema.gov/emergency-managers/practitioners/resilience-analysis-and-planning-tool

FEMA Flood Assessment Structure Tool (FAST)

https://www.fema.gov/sites/default/files/documents/fema_flood-assessment-structure-tool.pdf

FEMA HAZUS

https://www.fema.gov/flood-maps/products-tools/hazus

Other Assistance and Resources

FEMA: Grant Application Training

Each year, FEMA partners with the State on training courses designed to help communities be more successful in their applications for grants. Contact your State Hazard Mitigation Officer for course offering schedules. Example courses:

- Hazard Mitigation Grant Assistance Application Development Course
- Benefit Cost Analysis (BCA) courses

FEMA: Community Assistance Visit

If a jurisdiction is participating in the National Flood Insurance Program, it may be appropriate to set up a Community Assistance Visit with FEMA to provide technical assistance to communities in the review and/or updating of their floodplain ordinances to meet the new model ordinance. Consider contacting your State NFIP Coordinator for more information.

FEMA: Building Science

The Building Science branch develops and produces multi-hazard mitigation publications, guidance materials, tools, technical bulletins, and recovery advisories that incorporate the most up-to-date building codes, floodproofing requirements, seismic design standards, and wind design requirements for new construction and the repair of existing buildings. To learn more, visit: https://www.fema.gov/building-science

RESOLUTION 25-007
Teton County Board of County Commissioners
Teton County, Wyoming

(Adopting the 2025 Wyoming Region 8 Hazard Mitigation Plan)

WHEREAS, Teton County recognizes the threat that natural hazards pose to people and property within our jurisdiction; and

WHEREAS, undertaking hazard mitigation actions reduces the potential for harm to people and property from future hazard occurrences; and

WHEREAS, Teton County resides within Wyoming Region 8 and fully participated in the collaborative mitigation planning process; and

WHEREAS, the current Region 8 Hazard Mitigation Plan expires on May 29, 2025, and a five-year update has been completed;

NOW THEREFORE, be it resolved, that the Teton County Board of County Commissioners hereby adopts the 2025–2030 Wyoming Region 8 Hazard Mitigation Plan as the County's official hazard mitigation planning document.

AND IT IS FURTHER RESOLVED, Teton County will submit this Adoption Resolution to the Wyoming Office of Homeland Security and FEMA Region VIII to enable the Plan's final approval. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions at or before the end of the next five-year update cycle.

Adopted on the 20th day of May, 2025.

Mark Newcomb, Chairman
Teton County Board of County Commissioners

Attest: Rose Roberts on behalf of Maureen Murphy
Maureen E. Murphy
Teton County Clerk

STATE OF WYOMING COUNTY CLERK TETON COUNTY

Resolution # 25-11

Adopting the 2025 Wyoming Region 8 Hazard Mitigation Plan

WHEREAS, the Town of Jackson recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, undertaking hazard mitigation actions reduces the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the Town of Jackson resides within Wyoming Region 8 and fully participated in the collaborative mitigation planning process; and

WHEREAS, the current Region 8 Hazard Mitigation Plan expires on May 29, 2025, and a five-year update has been completed;

WHEREAS, The Town Council, by adoption of this resolution adopts the 2025 Wyoming Region 8 Hazard Mitigation Plan, attached hereto as Appendix A, and rescinds all previous Hazard Mitigation Plans; and

NOW, THEREFORE, BE IT RESOLVED, by the Town Council of the Town of Jackson, Wyoming having duly met on June 2, 2025, at a Regular Town Council Meeting, which was properly noticed and open to the public, and having fully considered the matter at hand, that the 2025–2030 Wyoming Region 8 Hazard Mitigation Plan is hereby adopted as follows:

> **The Jackson Town Council adopts this Resolution 25-11, replacing the previous Town of Jackson Hazard Mitigation Plan, with the 2025 Wyoming Region 8 Hazard Mitigation Plan attached hereto as Appendix A.**

BE IT FURTHER RESOLVED, the Town of Jackson will submit this Adoption Resolution to the Wyoming Office of Homeland Security and FEMA Region VIII to enable the Plan's final approval. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions at or before the end of the next five-year update cycle.

PASSED, APPROVED, AND ADOPTED this 2nd day of June 2025.

TOWN OF JACKSON

Arne O. Jorgensen, Mayor

ATTEST: _____

THE TOWN OF JACKSON INCORPORATED SEAL 1914 TETON COUNTY, WYOMING

Riley Hovorka, Town Clerk

Hazard Mitigation Plan Adoption Resolution

Adopting the 2025 Wyoming Region 8 Hazard Mitigation Plan

Whereas, *Teton Conservation District recognizes the threat that natural hazards pose to people and property within our community; and*

Whereas, *undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and*

Whereas, *an adopted Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and*

Whereas, *Teton Conservation District resides within the Planning Area, and fully participated in the mitigation planning process to prepare this Hazard Mitigation Plan; and*

Now, therefore, be it resolved, *that the Teton Conservation District Board of Supervisors, hereby adopts the Wyoming Region 8 Hazard Mitigation Plan, as an official plan; and*

Be it further resolved, *the Teton Conservation District will submit this Adoption Resolution to the Wyoming Office of Homeland Security and FEMA Region VIII to enable the Plan's final approval. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions at or before the end of the next five year update cycle.*

Passed: May 21, 2025

Certifying Official: Roby Hurley, Teton Conservation District Board Chair

RESOLUTION NO. 2025-01
OF THE
JACKSON HOLE AIRPORT BOARD
ADOPTING THE 2025 WYOMING REGION 8 HAZARD MITIGATION PLAN
June 18, 2025

The Jackson Hole Airport Board (the "Board"), a body corporate, organized under the laws of Wyoming, finds that:

WHEREAS, the Board recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, an adopted Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post- disaster mitigation grant programs; and

WHEREAS, the Jackson Hole Airport resides within the Planning Area, and fully participated in the mitigation planning process to prepare this Hazard Mitigation Plan;

NOW, THEREFORE, it is resolved by the Board, in open and public meeting as follows:

1. The Board hereby adopts the Wyoming Region 8 Hazard Mitigation Plan, as an official plan; and

2. The Board will submit this Adoption Resolution to the Wyoming Office of Homeland Security and FEMA Region VIII to enable the Plan's final approval. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions at or before the end of the next five year update cycle.

Adopted by the Board in open and public meeting this 18th day of June 2025.

JACKSON HOLE AIRPORT BOARD

Signed by:
By: Rob Wallace
F269DAA161514DF...
Rob Wallace, President

ATTEST

Signed by:
By: Ed Liebzeit
D6CB93D53305453...
Ed Liebzeit, Secretary

FLAT CREEK WATERSHED IMPROVEMENT DISTRICT

PO Box 2037 Jackson, WY 83001 www.fcwid.org

RESOLUTION NO. 25-01

A RESOLUTION ADOPTING THE 2025-2030 WYOMING REGION 8 HAZARD MITIGATION PLAN

WHEREAS the Flat Creek Watershed Improvement District (FCWID) is a political subdivision of the State of Wyoming, established with its formation as a special district in 2015 pursuant to Wyo. Stat.§ 22-29-101 through 22-29-119 and 41-8-101 through 41-8-126; and

WHEREAS, the FCWID recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, undertaking hazard mitigation actions reduces the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the FCWID resides within Wyoming Region 8 and fully participated in the collaborative mitigation planning process; and

WHEREAS, the current Region 8 Hazard Mitigation Plan expired on May 29, 2025, and a five-year update has been completed;

WHEREAS, the Board of the FCWID, by adoption of this resolution adopts the 2025 Wyoming Region 8 Hazard Mitigation Plan, attached hereto as Appendix A; and

NOW, THEREFORE, BE IT RESOLVED, by the Board of the Flat Creek Watershed Improvement District, having duly met on July 10, 2025, at a Regular Board Meeting, which was properly noticed and open to the public, and having fully considered the matter at hand, that the 2025–2030 Wyoming Region 8 Hazard Mitigation Plan is hereby adopted.

BE IT FURTHER RESOLVED, the FCWID will submit this Adoption Resolution to the Wyoming Office of Homeland Security and FEMA Region VIII to enable the Plan's final approval. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions at or before the end of the next five-year update cycle.

APPROVED, PASSED, AND ADOPTED by the Board of Directors of the Flat Creek Watershed Improvement District on this 10th day of July, 2025.

S. Buckstaff, Jr.

Sinclair Buckstaff, Jr., Chairman
Flat Creek Watershed Improvement District Board of Directors

APPENDIX C: Acronyms, Definitions, and References

ACRONYMS

AIP	Airfield Improvement Program
ACS	American Community Survey
AWN	Alert, Warning, and Notification System Coordination
BLM	Bureau of Land Management
BRIC	Building Resilient Infrastructure and Communities
CAMA	Computer Assisted Mass Appraisal
CD	Climate Divisions
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CMAQ	Community Multiscale Air Quality Modeling
COVID-19	Coronavirus Disease 2019
CPAW	Community Planning Assistance for Wildfire
CPT	Community Planning Team
CRS	Community Rating System
CWPP	Community Wildfire Protection Plan
DEWS	Drought Earling Warning System
DFIRM	Digital Flood Insurance Rate Maps
DMA	Disaster Mitigation Act
EF	Enhanced Fujita
EAS	Emergency Alert System
EMC	Emergency Management Coordinator
EMPG	Emergency Management Performance Grant
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
ESF	Emergency Support Functions

FAA	Federal Aviation Administration
FCWID	Flat Creek Watershed Improvement District
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flooding Mitigation Assistance
FMAGP	Fire Management Assistance Grant Program
GIS	Geographic Information System
GMP	Growth Management Program
GSM	Good Samaritan Mission
Hazus-MH	Hazards, United States-Multi Hazard
HIFLD	Homeland Infrastructure Foundation-Level
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HMPC	Hazard Mitigation Planning Committee
HIRA	Hazard Identification and Risk Assessment
HVRI	Hazards and Vulnerability Research Institute
IDA	Idaho Falls Regional Airport
LDR	Land Development Regulations
JAC	Jackson Hole Airport
JHFEMS	Jackson Hole Fire Emergency Management and Services
JHMR	Jackson Hole Mountain Resort
LDR	Land Development Regulations
LEPC	Local Emergency Planning Committee
MMI	Modified Mercalli Intensity
NCDC	National Climate Data Center
NCEI	National Centers for Environmental Information
NDMC	National Drought Mitigation Center
NFHL	National Flood Hazard Layer

NFIP	National Flood Insurance Program
NEPA	National Environmental Policy Act
NID	National Inventory of Dams
NIDIS	National Integrated Drought Information System
NIFC	National Interagency Fire Center
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
NRI	National Risk Index
NWA	National Weather Administration
NWS	National Weather Service
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Administration
PGA	Peak Ground Acceleration
PUG	Plan Update Guide
SBA	Small Business Administration
SFHA	Special Flood Hazard Area
SHELDUS	Spatial Hazard Events and Losses Database
SLC	Salt Lake City (International Airport)
SNAP	Supplemental Nutrition Assistance Program
SPET	Specific Purpose Excise Tax
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, Environmental
SVI	Social Vulnerability Index
TAWPC	Teton Area Wildfire Protection Coalition
TCD	Teton's Conservation District
TCEM	Teton County Emergency Management
TCHD	Teton County Health Department
TCSO	Teton County Sherrif's Office
TEAM	Transportation Emergency Alternatives Management
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey

VOAD	Voluntary Organizations Active in Disasters
VOC	Volatile Organic Compounds
WICMAA	Wyoming Inter-County Mutual Aid Agreement
WDA	Wyoming Department of Agriculture
WDDO	Wyoming Water Development Office
WOHS	Wyoming Office of Homeland Security
WSGS	Wyoming State Geologic Survey
WSFD	Wyoming State Forestry Division
WYDEQ	Wyoming Department of Environmental Quality
WYDOT	Wyoming Department of Transportation
WYWRAP	Wyoming Wildfire Risk Assessment Portal
WSEO	Wyoming State Engineers Office
WUI	Wildland-Urban Interface
WY	Wyoming

Definitions

100-Year Flood: The term "100-year flood" can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1% chance of being equaled or exceeded in any given year. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management Agency (FEMA) defines it as the 1% annual chance flood, which is now the standard definition used by most federal and state agencies and by the National Flood Insurance Program (NFIP).

Acre-Foot: An acre-foot is the amount of water it takes to cover 1 acre to a depth of 1 foot. This measure is used to describe the quantity of storage in a water reservoir. An acre-foot is a unit of volume. One acre foot equals 7,758 barrels; 325,829 gallons; or 43,560 cubic feet. An average household of four will use approximately 1 acre-foot of water per year.

Asset: An asset is any man-made or natural feature that has value, including, but not limited to, people; buildings; infrastructure, such as bridges, roads, sewers, and water systems; lifelines, such as electricity and communication resources; and environmental, cultural, or recreational features such as parks, wetlands, and landmarks.

Base Flood: The flood having a 1% chance of being equaled or exceeded in any given year, also known as the "100-year" or "1% chance" flood. The base flood is a statistical concept used to ensure that all properties subject to the NFIP are protected to the same degree against flooding.

Basin: A basin is the area within which all surface water—whether from rainfall, snowmelt, springs, or other sources—flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Basins are also referred to as "watersheds" and "drainage basins."

Benefit: A benefit is a net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit/cost analysis of proposed mitigation measures, benefits are limited to specific, measurable risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

Benefit/Cost Analysis: A benefit/cost analysis is a systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Building: A building is defined as a structure that is walled and roofed, principally aboveground, and permanently fixed to a site. The term includes manufactured homes on permanent foundations on which the wheels and axles carry no weight.

Capability Assessment: A capability assessment provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability

Community Rating System (CRS): The CRS is a voluntary program under the NFIP that rewards participating communities (provides incentives) for exceeding the minimum requirements of the NFIP and completing activities that reduce flood hazard risk by providing flood insurance premium discounts.

Conflagration: A fire that grows beyond its original source area to engulf adjoining regions. Wind, extremely dry or hazardous weather conditions, excessive fuel buildup, and explosions are usually the elements behind a wildfire conflagration.

Critical Facility: Facilities and infrastructure that are critical to the health and welfare of the population. These become especially important after any hazard event occurs. For the purposes of this plan, critical facilities include:

- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic or water reactive materials.
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a hazard event.
- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for disaster response before, during, and after hazard events.
- Public and private utilities, facilities and infrastructure that are vital to maintaining or restoring normal services to areas damaged by hazard events.
- Government facilities.

Dam: A man-made barrier, together with appurtenant structures, constructed above the natural surface of the ground for the purpose of impounding water.

Dam Failure: Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size, mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

Dam Incident: Situations at dams that require an immediate response by dam safety engineers. These are episodes that without intervention will likely result in a dam failure.

High Hazard Dam: Dams where failure or operational error will probably cause loss of human life.

Significant Hazard Dam: Dams where failure or operational error will result in no probable loss of human life but can cause economic loss, environmental damage, or disruption of lifeline facilities, or can impact other concerns. Significant hazard dams are often located in rural or agricultural areas but could be located in areas with population and significant infrastructure.

Low-Hazard Dam: No probable loss of human life and low economic or environmental losses; losses are principally limited to the owner's property.

Low Head Dam: Engineered structures built into and across stream and river channels for a variety of purposes. Water flows over the dams continuously, as they span from one riverbank to the other. Low head dams generally range in height from 1-15 feet.

Debris Flow: Dense mixtures of water-saturated debris that move down-valley; looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable, and move down slope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods.

Debris Slide: Debris slides consist of unconsolidated rock or soil that has moved rapidly down slope. They occur on slopes greater than 65%.

Disaster Mitigation Act of 2000 (DMA): The DMA is Public Law 106-390 and is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before

they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP) were established.

Drought: Drought is a period of time without substantial rainfall or snowfall from one year to the next. Drought can also be defined as the cumulative impacts of several dry years or a deficiency of precipitation over an extended period of time, which in turn results in water shortages for some activity, group, or environmental function. A hydrological drought is caused by deficiencies in surface and subsurface water supplies. A socioeconomic drought impacts the health, well-being, and quality of life or starts to have an adverse impact on a region. Drought is a normal, recurrent feature of climate and occurs almost everywhere.

Earthquake: A sudden slip on a fault, volcanic or magmatic activity, and sudden stress changes in the earth that result in ground shaking and radiated seismic energy.

> **Epicenter**: The point on the earth's surface directly above the hypocenter of an earthquake. The location of an earthquake is commonly described by the geographic position of its epicenter and by its focal depth.
>
> **Fault**: A fracture in the earth's crust along which two blocks of the crust have slipped with respect to each other.
>
> **Focal Depth**: The depth from the earth's surface to the hypocenter.
>
> **Hypocenter**: The region underground where an earthquake's energy originates.
>
> **Liquefaction**: Loosely packed, water-logged sediments losing their strength in response to strong shaking, causing major damage during earthquakes.

Emergency Action Plan: A document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities. It also contains inundation maps to show emergency management authorities the critical areas for action in case of an emergency.

Erosion: The removal and simultaneous transportation of soil or other earth materials from one location to another by water, wind, waves, or moving ice. Deposition is the placing of eroded material in a new location.

Exposure: Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

Extent: The extent is the size of an area affected by a hazard.

Extreme Heat: Summertime weather that is substantially hotter or more humid than average for a location at that time of year.

Flood: The inundation of normally dry land resulting from the rising and overflowing of a body of water.

> **Flash Flood**: A flash flood occurs with little or no warning when water levels rise at an extremely fast rate
>
> **Flood Insurance Rate Map (FIRM)**: FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).
>
> **Flood Insurance Study:** A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's FIRM. The study contains such background data

as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A FIRM identifies most, but not necessarily all, of a community's floodplain as the SFHA.

1% Annual Chance Floodplain or 100-Year Floodplain: The area flooded by a flood that has a 1% chance of being equaled or exceeded each year. This is a statistical average only; a 100-year flood can occur more than once in a short period of time. The 1% annual chance flood is the standard used by most federal and state agencies.

0.1% Annual Chance Floodplain or 500-Year Floodplain: The area flooded by a flood that has a 0.1% chance of being equaled or exceeded each year. This is a statistical average only; a 500-year flood can occur more than once in a short period of time.

Floodway: Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than 1 foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

Floodway Fringe: Floodway fringe areas are located in the floodplain but outside of the floodway. Some development is generally allowed in these areas, with a variety of restrictions. On maps that have identified and delineated a floodway, this would be the area beyond the floodway boundary that can be subject to different regulations.

Freeboard: Freeboard is the margin of safety added to the base flood elevation.

Freezing Rain: The result of rain occurring when the temperature is below the freezing point. The rain freezes on impact, resulting in a layer of glaze ice up to an inch thick. In a severe ice storm, an evergreen tree 60 feet high and 30 feet wide can be burdened with up to 6 tons of ice, creating a threat to power and telephone lines and transportation routes.

Frequency: For the purposes of this plan, frequency refers to how often a hazard of specific magnitude, duration, or extent is expected to occur on average. Statistically, a hazard with a 100-year frequency is expected to occur about once every 100 years on average and has a 1% chance of occurring any given year. Frequency reliability varies depending on the type of hazard considered.

Goal: A goal is a general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve. The success of a hazard mitigation plan is measured by the degree to which its goals have been met (that is, by the actual benefits in terms of actual hazard mitigation).

Geographic Information System (GIS): GIS is a computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

Hazard: A hazard is a source of potential danger or adverse condition that could harm people or cause property damage.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster

Hazards U.S. Multi-Hazard (Hazus-MH) Loss Estimation Program: Hazus-MH is a GIS-based program used to support the development of risk assessments as required under the DMA. The Hazus-MH software program assesses risk in a quantitative manner to estimate damages and losses associated with natural hazards. Hazus-MH is FEMA's nationally applicable, standardized methodology and software program and contains modules for estimating potential losses from earthquakes, floods, and wind hazards. Hazus-MH has also been used to assess vulnerability (exposure) for other hazards.

Hydrology: Hydrology is the analysis of waters of the earth. For example, a flood discharge estimate is developed by conducting a hydrologic study.

Intensity: For the purposes of this plan, intensity refers to the measure of the effects of a hazard.

Inventory: The assets identified in a study region comprise an inventory. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

Lightning: Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt," usually within or between clouds and the ground. A bolt of lightning instantaneously reaches temperatures approaching 50,000ºF. The rapid heating and cooling of air near lightning causes thunder. Lightning is a major threat during thunderstorms. In the United States, 75 to 100 Americans are struck and killed by lightning each year (see http://www.fema.gov/hazard/thunderstorms/thunder.shtm).

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Magnitude: Magnitude is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Mass Movement: A collective term for landslides, debris flows, falls and sinkholes.

Mitigation: A preventive action that can be taken in advance of an event that will reduce or eliminate the risk to life or property.

Mitigation Initiatives (or Mitigation Actions): Mitigation initiatives are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

Mudslide, Mudflow, or Debris Flow: A river of rock, earth, organic matter, and other materials saturated with water.

Objective: For the purposes of this plan, an objective is defined as a short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal.

Pandemic: An epidemic that has spread across multiple continents or worldwide, affecting a substantial number of individuals.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Preparedness: Preparedness refers to actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Presidential Disaster Declaration: These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.

Probability of Occurrence: The probability of occurrence is a statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

Repetitive Loss Property: Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of $1000.00; or
- Two paid flood losses in excess of $1000.00 within any 10-year period since 1978 or
- Three or more paid losses that equal or exceed the current value of the insured property.

Return Period (or Mean Return Period): This term refers to the average period of time in years between occurrences of a particular hazard (equal to the inverse of the annual frequency of occurrence).

Riparian Zone: The area along the banks of a natural watercourse.

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Risk: Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment: Risk assessment is the process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

Robert T. Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107, was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, Public Law 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Severe Local Storm: Small-scale atmospheric systems, including tornadoes, thunderstorms, windstorms, ice storms, and snowstorms. These storms may cause a great deal of destruction and even death, but their impact is generally confined to a small area. Typical impacts are on transportation infrastructure and utilities.

Special Flood Hazard Area: The base floodplain delineated on a FIRM. The SFHA is mapped as a Zone A in riverine situations. The SFHA may or may not encompass all of a community's flood problems

Stakeholder: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact hazard mitigation.

Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%. For this study, steep slope is defined as slopes greater than 33%.

Subsidence: The sinking of the ground over human-caused or natural underground voids, or the settlement of native low-density soils.

Thunderstorm: A thunderstorm is a storm with lightning and thunder produced by cumulonimbus clouds. Thunderstorms usually produce gusty winds, heavy rains, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry seasons.

Tornado: A tornado is a violently rotating column of air extending between and in contact with a cloud and the surface of the earth. Tornadoes are often (but not always) visible as funnel clouds. On a local scale, tornadoes are the most intense of all atmospheric circulations, and winds can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long.

Vulnerability: Vulnerability describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. Flooding of an electric substation would affect not only the substation itself but businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

Watershed: A watershed is an area that drains downgradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

Wildfire: Wildfire refers to any uncontrolled fire occurring on undeveloped land that requires fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, topography, and air mass. Fuel can include living and dead vegetation on the ground, along the surface as brush and small trees, and in the air such as tree canopies. Topography includes both slope and elevation. Air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount, duration, and the stability of the atmosphere at the time of the fire. Wildfires can be ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson.

Wildland Urban Interface (WUI) Area: An area susceptible to wildfires and where wildland vegetation and urban or suburban development occur together. An example would be smaller urban areas and dispersed rural housing in forested areas.

Windstorm: Windstorms are generally short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.

Winter Storm: A storm having significant snowfall, ice, or freezing rain; the quantity of precipitation varies by elevation.

Zoning Ordinance: The zoning ordinance designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

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