RESOLUTION NO. 16

Series 2020

A RESOLUTION ADOPTING THE SUMMIT COUNTY MULTI-JURISDICTIONAL MITIGATION PLAN UPDATE

WHEREAS, the Town Council of the Town of Breckenridge 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, the Town of Breckenridge fully participated in the mitigation planning process to prepare the Summit County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the Town Council previously adopted the Summit County Multi-Jurisdictional Hazard Mitigation Plan as an official plan; and

WHEREAS, there has been prepared an update to the Summit County Multi-Jurisdictional Hazard Mitigation Plan dated March 2020; and

WHEREAS, the Colorado Office of Emergency Management and Federal Emergency Management Agency, Region VIII officials have reviewed the Summit County Multi-Jurisdictional Hazard Mitigation Plan Update Dated March 2020, and approved it contingent upon the official adoption of the plan by the participating governing bodies.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF BRECKENRIDGE, COLORADO:

Section 1. The Town Council of the Town of Breckenridge hereby adopts the Summit County Multi-Jurisdictional Hazard Mitigation Plan Update Dated March 2020 as an official plan.

Section 2. This resolution is effective upon adoption.

RESOLUTION APPROVED AND ADOPTED this 9th day of June, 2020.

TOWN OF BRECKENRIDGE, a Colorado municipal corporation

By:_____
Eric S. Mamula, Mayor

ATTEST:

_____
Helen Cospolich, CMC,
Town Clerk

APPROVED IN FORM

_____ 6/9/20
Town Attorney Date

SUMMIT COUNTY
COLORADO

Multi-Jurisdictional Hazard Mitigation Plan Update

March 2020

Table of Contents

Appendices

Executive Summary

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazard. Summit County and participating jurisdictions first developed this multi-hazard mitigation plan in 2008 to reduce future losses to the County and its communities resulting from natural hazards. The plan was updated in 2013 in accordance with the requirements of the Disaster Mitigation Act of 2000 and to maintain eligibility for the Federal Emergency Management Agency (FEMA) Flood Mitigation Assistance, Pre-Disaster Mitigation, Hazard Mitigation Grant Programs. Since the original development of this plan, FEMA guidance for local hazard mitigation plans has been refined and updated. This plan was updated again in 2020 to be compliant with the five-year update cycle requirement and consistent with the 2013 FEMA guidance and with Summit County's current hazard mitigation priorities and risks.

The Summit County Multi-Hazard Mitigation Plan Update is a multi-jurisdictional plan that covers the following local governments that participated in the planning process during the 2020 update:

- Summit County
- Town of Blue River
- Town of Breckenridge
- Town of Dillon
- Town of Frisco
- Town of Silverthorne
- Buffalo Mountain Metropolitan District
- Summit Fire and EMS Authority*
- Red, White, and Blue Fire Protection District
- Copper Mountain Consolidated Metropolitan District
- Hamilton Creek Metropolitan District
- Denver Water
- Dillon Valley District
- East Dillon Water District
- Mesa Cortina Water and Sanitation District

* Quasi 'new' participating jurisdiction in 2020 as this incorporated the Lake Dillon Fire Protection District and the fire services of Copper Mountain Consolidated Metropolitan District

The County's planning process followed a methodology prescribed by FEMA, which began with the reconvening of the Hazard Mitigation Planning Committee (HMPC) comprised of key stakeholders from Summit County, participating jurisdictions, neighboring counties and stakeholders, and state and federal agencies. The HMPC conducted an updated risk assessment that identified and profiled hazards that pose a risk to Summit County, assessed the County's vulnerability to these hazards, and examined the capabilities in place to mitigate them. New methodologies were used where applicable to provide a more thorough risk and vulnerability assessment. The County is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Floods, wildfires, severe winter weather, and avalanche are among the hazards that can have a significant impact on the County.

Based upon the risk assessment, the HMPC revisited the goals and objectives for reducing risk to hazards. The goals and objectives of this multi-hazard mitigation plan are to:

Goal 1: Reduce risk to the people, property, and environment of Summit County from the impacts of hazards

- Minimize the vulnerability of existing and new development to hazards
- Increase education and awareness of hazards and risk reduction measures

- Improve comprehensive wildfire planning, funding, and mitigation
- Strengthen floodplain management programs

Goal 2: Protect critical facilities and infrastructure

- Enhance assessment of multi-hazard risk to critical facilities and infrastructure
- Prioritize mitigation projects based on the enhanced assessment and identify funding sources
- Reduce hazard related closures of transportation routes

Goal 3: Minimize economic losses

- Strengthen disaster resistance and resiliency of businesses and employers
- Promote and conduct continuity of operations and continuity of governance planning
- Reduce financial exposure of county and municipal governments and special districts

Goal 4: Implement the mitigation actions identified in the plan

- Improve communication and coordination between communities and state and federal agencies
- Engage collaborative partners, including community organizations, businesses, and others
- Integrate mitigation activities into existing and new community plans and policies
- Monitor, evaluate, and update the mitigation plan

To meet identified goals and objectives, the plan recommends the mitigation actions summarized in Chapter 4 of this plan and in the jurisdictional annexes. The list of actions from 2013 was reviewed by the HMPC. Committee members noted which actions were completed, deleted, deferred, or ongoing and provided reasons why these decisions were made. The Committee also developed new actions which are included in Chapter 4 and the jurisdictional annexes. The HMPC also developed an implementation plan for each action, which identifies priority level, background information, ideas for implementation, responsible agency, timeline, cost estimate, and potential funding sources. The multi-hazard mitigation plan has been formally adopted by the Summit County Board of County Commissioners and the governing bodies of each participating jurisdiction and will be updated within a five-year timeframe.

1 Introduction and Planning Area Profile

1.1 Purpose

Summit County and several participating jurisdictions prepared this updated local hazard mitigation plan to guide hazard mitigation planning to better protect the people and property of the County from the effects of hazard events. This plan demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. The plan is intended to be a living document through ongoing implementation and regular updates every five years. The original plan was developed in 2008 and updated in 2013 and 2020.

The four goals of the Summit County Multi-Hazard Mitigation Plan are the following:

- Goal 1: Reduce risk to the people, property, and environment of Summit County from the impacts of hazards
- Goal 2: Protect critical facilities and infrastructure
- Goal 3: Minimize economic losses
- Goal 4: Implement the mitigation actions identified in the plan

This plan was also developed to maintain Summit County and participating jurisdiction's eligibility for certain federal disaster assistance, specifically the Federal Emergency Management Agency's (FEMA), Hazard Mitigation Assistance (HMA) grants including the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) and Pre-Disaster Mitigation (PDM) program, as well as to make the County more disaster resistant.

1.2 Background and Scope

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

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005). An update to this report in 2017 (Natural Hazard Mitigation Saves: 2017 Interim Report) indicates that mitigation grants funded through select federal government agencies, on average, can save the nation $6 in future disaster costs for every $1 spent on hazard mitigation.

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 determined, prioritized, and implemented. This plan documents Summit County's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County and participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability in Summit County.

1.3 Multi-Jurisdictional Planning

The Summit County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that geographically covers everything within Summit County's jurisdictional boundaries (hereinafter referred to as the planning area). Unincorporated Summit County and the following communities and special districts participated in the 2020 update planning process:

- Summit County
- Town of Blue River
- Town of Breckenridge
- Town of Dillon
- Town of Frisco
- Town of Silverthorne
- Buffalo Mountain Metropolitan District
- Copper Mountain Consolidated Metropolitan District
- East Dillon Water District
- Hamilton Creek Metropolitan District
- Dillon Valley District
- Mesa Cortina Water and Sanitation District
- Denver Water
- Red, White, and Blue Fire Protection District
- Summit Fire & EMS *

* Quasi 'new' participating jurisdiction in 2020 as this incorporated the Lake Dillon Fire Protection District and the fire services of Copper Mountain Consolidated Metropolitan District

This plan underwent a comprehensive update in 2020 in fulfillment of the five-year update requirement. This plan was originally prepared in 2008, and went through a plan update process in 2013, 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. The 2007 amendments also incorporate mitigation planning requirements of the Flood Mitigation Assistance (FMA) program authorized by the National Flood Insurance Act of 1968. While the Disaster Mitigation Act 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 Summit County planning and response 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 their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The Summit County planning area has been affected by hazards in the past and is thus committed to reducing future impacts from hazard events and becoming eligible for mitigation-related federal funding.

This plan addresses natural hazards and one human-caused hazard—hazardous materials. Although the members of the Summit County Hazard Mitigation Planning Committee (HMPC) recognize that FEMA encourages communities to integrate human-caused hazards into the mitigation planning process, the scope of this effort did not address other human-caused hazards for several reasons. First, many of the

planning activities for the mitigation of these hazards are either underway or complete and are addressed in the emergency operations plan for Summit County. Second, the Disaster Mitigation Act of 2000 requires extensive public information and input, and this is in direct conflict with the confidentiality necessary in planning for chemical, biological, and radiological terrorism. Thus the HMPC determined it was not in the planning area's best interests to publicly share specific information about its vulnerability to human-caused hazards.

1.3.1 Jurisdictional Annexes

Each jurisdiction participating in this plan developed its own annex, which provides a more detailed assessment of the jurisdiction's unique risks as well as their mitigation strategy to reduce long-term losses. Each jurisdictional annex contains the following:

- Community profile summarizing geography and climate, history, economy, population growth and development trends
- Hazard information on location, previous occurrences, probability of future occurrences, climate change considerations (new in 2020 update) and magnitude/severity (extent) for each hazard
- Hazard map(s) at an appropriate scale for the jurisdiction, if available
- Number and value of buildings, critical facilities, and other community assets located in hazard areas, if available
- Vulnerability information in terms of future growth and development in hazard areas
- A capability assessment describing existing regulatory, administrative, technical, and fiscal resources and tools as well as outreach efforts and partnerships and past mitigation projects. Includes an assessment of opportunities to enhance existing capabilities as well.
- Mitigation actions specific to the jurisdiction, including a review of previous actions from the 2013 plan and progress made on implementation.

1.4 Plan Organization

The Summit County Multi-Hazard Mitigation Plan is organized as follows:

- Executive Summary
- Chapter 1: Introduction and Planning Area Profile
- Chapter 2: Planning Process
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Jurisdictional Annexes

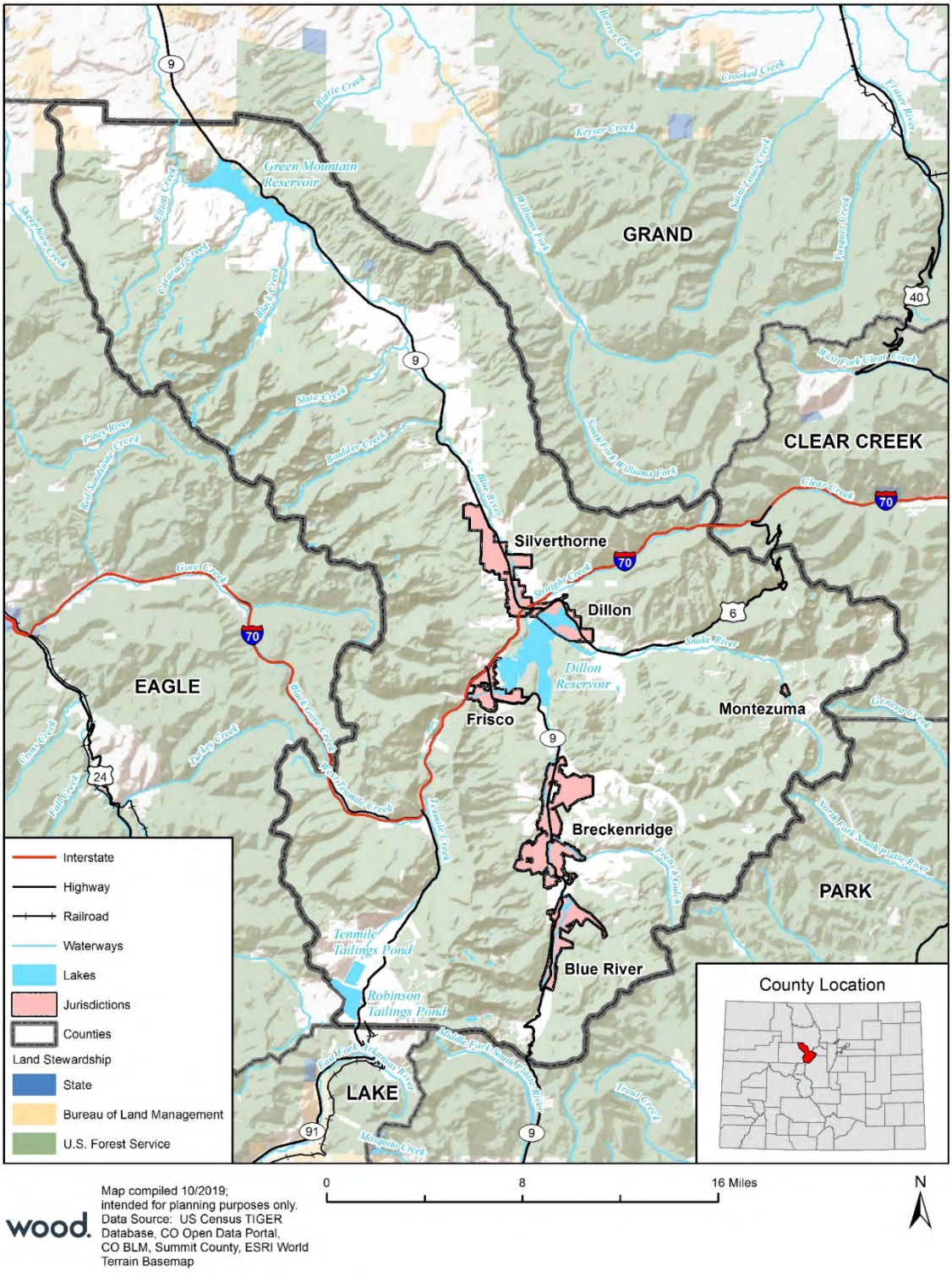
Appendices

- Appendix A: References
- Appendix B: Planning Process Documentation
- Appendix C: Mitigation Action Alternatives and Prioritization
- Appendix D: Hazard Mitigation Planning Committee
- Appendix E: Local Plan Adoptions

1.5 Planning Area Profile

Figure 1-1 shows a map of the Summit County planning area.

Figure 1-1 Summit County



1.5.1 Geography and Climate

Summit County is located high in the Colorado Rockies along the west side of the Continental Divide. It encompasses approximately 619 square miles and is located slightly northwest of the geographic center of Colorado. Interstate 70, the state's main east-west transportation corridor, bisects the County. The County is bounded by Grand (north), Clear Creek (east), Park (southeast), Lake (southwest), and Eagle counties (west). The eastern section of White River National Forest and Eagles Nest Wilderness are located in Summit County.

The County's topography includes broad mountain valleys flanked by high peaks. Several mountain ranges converge in the County, including portions of the Gore Range, the Ten Mile Range, and the Front Range. Elevations range from 7,500 feet at the northern end of the County where the Blue River enters Grand County to 14,278 feet at the summit of Grays Peak.

Vegetation is based primarily on elevation. The lowest elevation areas in the Lower Blue Basin are composed primarily of sage meadows. At around 9,000 feet and above, coniferous forest predominates. Timberline is located at approximately 11,500 feet, with areas above that elevation comprised of snow, rock, and alpine tundra.

The County has one major drainage basin, that of the Blue River. The river flows northerly throughout the County. Two large reservoirs, Dillon and Green Mountain, are located in the central and northern portions of the County, respectively. These reservoirs impound the Blue River, which intersects with the Colorado River about 15 miles north of the County border. Two large tributaries, the Snake River and Ten Mile Creek, also enter Dillon Reservoir.

At the lowest elevations, around Green Mountain Reservoir, summer high temperatures reach into the low 80s. At the County's higher elevations, high temperatures can be significantly cooler, with evening temperatures that can dip into the 30s. Winter lows occasionally drop below -35°F, though daytime temperatures are often in the 20s and 30s. The relative humidity is quite low throughout the year. Much of the annual precipitation comes in the form of winter snow, but afternoon summer thunderstorms are common. Snow is possible at any time of year in the highest elevations.

1.5.2 Population

Summit County had the 18th largest population of the 64 counties in Colorado as of 2018. Summit County grew by 10 percent between 2010 and 2018. The total County population in 2018 was 30,974. The County's population has been steadily growing with a growth rate of 1.2 percent and an increase of 695 persons between 2015 and 2017 (State Demography Office). Roughly half of the County's population is in unincorporated areas. Population estimates from the Colorado State Demography Office and the American Community Survey Five-Year Estimates (2013-2017) were used for each of the incorporated towns and the unincorporated County are provided in Table 1-1. Further discussion on population growth and development trends can be found in Chapter 3, subsection 3.3.2.

With the reputation as a national and international center for winter sports and outdoor recreation, peak seasonal population in Summit County may swell to nearly 150,000 people. According to the County's Comprehensive Plan, monthly average population fluctuation indexes indicate that March has the highest seasonal population, with 147.4 percent of average occupation; May has the lowest with 54.1 percent of average. The County's visiting population from the Colorado Front Range swells significantly on weekends during ski season and the summer months.

Table 1-1 Summit County Total Population, 2010 vs. 2018

Jurisdiction	2010	2018	Population Change 2010 to 2018
Town of Blue River	853	926	73
Town of Breckenridge	4,552	4,989	437
Town of Dillon	906	968	62
Town of Frisco	2,694	3,194	500
Town of Montezuma	65	67	2
Town of Silverthorne	3,904	4,789	749
Unincorporated Summit County	15,099	16,041	881
Total Summit County	**28,073**	**30,974**	**2,561**

Source State Demography Office

Select demographic and social characteristics from the American Community Survey Five-Year Estimates (2013-2017) for Summit County are shown in Table 1-2. Characteristics for Summit County are for the entire County.

Table 1-2 Summit County Demographic and Social Characteristics

Characteristic	Summit County	Town of Blue River	Town of Breckenridge	Town of Dillon	Town of Frisco	Town of Montezuma	Town of Silverthorne
Gender/Age							
Male (%)	54.6	48.2	51.4	46.6	50.3	66.7	59.7
Female (%)	45.4	51.8	48.6	53.4	49.7	33.3	40.3
Under 5 Years (%)	4.3	8.0	2.3	10.2	1.0	0	5.8
65 Years and Over (%)	11.3	12.8	8.8	16.9	13.5	0	18.4
Median Age	39.2	39.3	30.7	47.0	48.1	30.8	46.6
Race/Ethnicity (one race)							
White (%)	81.9	95.8	95.0	6.3.3	87.6	100	64.6
Black (%)	1.7	0.4	1.8	4.4	0	0	6.6
American Indian and Alaska Native (%)	1.3	0	0	2.5	6.8	0.0	1.6
Asian (%)	0.8	0	0.1	2.1	1.7	0.0	0.3
Native Hawaiian and Other Pacific Islander (%)	0.5	0	0	6.7	0.0	0.0	0.3
Other (%)	6.2	2.2	1.0	5.0	1.4	0	15.1
Hispanic/Latino (Any Race) (%)	14.0	1.8	3.1	25.4	3.8	0	30.1
Other							
Average Household Size	3.1	3.1	3.3	2.3	2.5	3	3.2
Housing Units with no Vehicles Available (%)	1.6	0	0	7.7	0	3.8	8.4

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Housing Characteristics

The following tables summarizes the types of housing units and housing tenure (owner occupied, and renter occupied) in unincorporated Summit County.

Table 1-3 Types and Total Amounts of Housing Units in Unincorporated Summit County

Type of housing units	Total	Percentage
Total housing units	30,652	
1-unit detached	10,047	32.8%
1-unit attached	3,371	11.0%
2 units	687	2.2%
3 or 4 units	1,736	5.7%
5 to 9 units	3,227	10.5%
10 to 19 units	3,263	10.6%
20 or more units	7,985	26.1%
Mobile home	336	1.1%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table 1-4 Housing Tenure in Unincorporated Summit County

Type of housing units	Total
Occupied Housing	9,455
Owner Occupied	6,287
Renter Occupied	3,168

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

1.5.3 History

Summit County's history has included several waves of settlement and activity. Native Americans, who hunted in the area in the summer months, represented the first wave of settlers. In 1859, the second wave marked the official settlement of the area when gold was discovered in the Blue River just north of present-day Breckenridge. The Town of Breckenridge was founded, and it became the first permanent town on Colorado's Western Slope. Soon, other areas of the County were prospected and dozens of town settlements were established, including Frisco and Dillon.

While mining was the dominant employment activity in most of the County during the late 1800s and early 1900s, another source of income came from ranching. Ranching occurred throughout the valley areas of the County, but was most prevalent in the Lower Blue River valley. Because of the high elevation, ranching in the County has been mostly limited to raising cattle and growing hay. Some of the ranches in the County have been handed down through the family for generations and continue to be actively ranched.

By the 1960s, mining was mainly a memory of the past (with the exception of the Climax Molybdenum Mine at Fremont Pass), and the Arapahoe Basin and Breckenridge ski areas started to draw a new wealth to the County in the form of tourism. As skiing increased in popularity, the Keystone and Copper Mountain ski areas were created in the early 1970s, and the County experienced its third wave of settlement and growth. The current economy is based primarily on the County's recreational amenities.

1.5.4 Economy

Tourism and recreation dominate the County's economy. The local economy has transitioned from a dependence on mining in the late 1800s to dependence on some of the country's best-known and premier recreation and winter resorts. What started decades ago as a traditional seasonal ski economy has developed into a diverse year-round tourism-based economy. Four major ski areas are located in Summit County: Arapahoe Basin, Breckenridge, Copper Mountain, and Keystone. In the summer months, Dillon and Green Mountain reservoirs are popular recreation destinations. Approximately 80 percent of the land area in Summit County is publicly owned and is managed by the U.S. Forest Service. These lands offer a full spectrum of backcountry and wilderness recreation opportunities.

According to the U.S. Census American Community Survey Five-Year Estimates, 2013-2017, the industries that employed the highest percentages of Summit County's labor force were arts, entertainment, recreation, accommodation, and food services (27%); retail trade (15.4%), educational services, and health care and social assistance (10.4%); construction (10.3%), professional, scientific, and management, and administrative and waste management services (9.2%); finance, insurance, real estate, and rental and leasing (6.1%); other services (4.9%) and public administration (4.7%). Select economic characteristics for Summit County from the American Community Survey Five-Year Estimates, 2013-2017 are shown in Table 1-5.

Table 1-5 Summit County Economic Characteristics

Characteristic	Summit County	Town of Blue River	Town of Breckenridge	Town of Dillon	Town of Frisco	Town of Montezuma	Town of Silverthorne
Families below Poverty Level (%)	4.1	2.4	2.8	10.2	0.0	0.0	8.4
Individuals below Poverty Level (%)	10.3	6.4	7.6	10.0	2.7	5.1	13.2
Median Home Value ($)	567,700	605,500	433,300	484,800	577,000	600,000	593,400
Median Household Income ($)	73,538	94,844	76,774	76,042	67,938	60,000	50,727
Per Capita Income ($)	37,192	50,376	31,999	51,216	33,173	27,303	33,959
Population in Labor Force*	20,025	495	3,399	616	1,901	60	2,777
Unemployment (%)**	2.6	4.4	1.9	1.1	0.0	16.7	2.2

Source: U.S. Census Bureau American Community Survey 5-Year Estimates 2013-2017
*Population 16 years and over. **Civilian labor force only

2 PLANNING PROCESS

44 CFR Requirement 201.6(c)(1): [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.

2.1 Background on Mitigation Planning in Summit County

The Summit County Office of Emergency Management recognized the need and importance of this plan and was responsible for initiating the plan's original development and 2020 update process, which included securing funding. The first version of this plan was approved by FEMA in 2008 and updated in 2013. Since the original development of the plan, FEMA guidance for local hazard mitigation plans has been refined and updated. The County contracted with Wood Environment and Infrastructure Solutions, Inc. (Wood) in 2008, and 2013 to facilitate and develop a multi-jurisdictional, multi-hazard mitigation plan as well as its update.

The plan underwent a comprehensive update in 2019-2020. The planning process followed during the update was similar to what was used in the original plan development. This planning process utilized the input from a multi-jurisdictional Hazard Mitigation Planning Committee (HMPC). The process is described further in this section and documented in Appendix B. Wood Environment & Infrastructure Solutions, Inc (Wood), formerly AMEC, was procured to assist with the update in 2019.

Wood's role was to:

- Assist in reconvening a Hazard Mitigation Planning Committee (HMPC) for the County that incorporates key stakeholders and representatives from each participating jurisdiction
- Identify and invite new stakeholders to participate in the plan update process
- Meet all of the planning requirements of the Disaster Mitigation Act (DMA) and the Flood Mitigation Assistance program as established by federal regulations and following FEMA's planning guidance
- Facilitate the planning process
- Identify the data requirements that the HMPC can provide and conduct the research and documentation necessary to augment that data
- Develop and facilitate the public input process
- Produce the draft and final plan documents
- Coordinate the Colorado Department of Homeland Security and Emergency Management (DHSEM), and FEMA Region VIII reviews of the plan and its formal adoption by the Summit County Board of County Commissioners and the governing bodies of each of the participating jurisdictions

The remainder of this chapter provides a narrative description of the steps taken to prepare and update the hazard mitigation plan.

2.2 What's New in the Plan Update

DMA Requirement §201.6(d)(3):	*A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.*

The updated LHMP complies with Federal Emergency Management Agency (FEMA) guidance for Local Hazard Mitigation Plans. The update followed the requirements noted in the Disaster Mitigation Act (DMA) of 2000 and FEMA's 2013 Local Hazard Mitigation Planning Handbook.

This multi-jurisdictional multi-hazard mitigation plan update involved a comprehensive review and update of each section of the 2013 plan and includes an assessment of the success of Summit County and the participating jurisdictions in evaluating, monitoring, and implementing the mitigation strategy outlined in the initial plan. The process followed to review and revise the chapters of the plan during the 2020 update is detailed in Table 2-1. As part of this plan update, all sections of the plan were reviewed and updated to reflect new data and methodologies on hazards, risk analysis, capabilities, and mitigation strategies. The plan was also revised to reflect changes in development, including using the latest version of the assessor's office data as the basis for identifying overall and hazard exposure for developed parcels by County and jurisdiction. All relevant information and data still valid from the 2013 plan was carried forward as applicable to this plan update. Where applicable, the plan was revised to reflect changes in priorities, notably in the priority of hazard mitigation actions detailed in Chapter 4 and in the jurisdictional annexes.

The County received Hazard Mitigation Assistance grant funding from DHSEM and FEMA to procure consultant assistance during the 2020 update.

Table 2-1 2020 Plan Update Summary of Changes by Chapter

Plan Section	Update Review and Analysis
1.0 Introduction	Updated language to describe purpose and requirements of the Summit County Multi-Hazard Mitigation Plan update process. Identified new participating jurisdictions. Updated with American Community Survey 5-Year Estimates, 2013-2017 census data and current economy description.
2.0 Planning Process	Described and documented the planning process for the 2020 update, including coordination among agencies and integration with other planning efforts. Described any changes in participation in detail. Described 2020 public participation process.

Plan Section	Update Review and Analysis
3.0 Risk Assessment	Added a subsection on Climate Change Considerations to discuss where climate change could affect the frequency and severity of hazards in the future. Revisited former hazards list for possible modifications. Including adding Wildlife-Vehicle Collisions as a hazard. Added "swift-water" as a component of the flood hazard profile. Reviewed hazards from the 2018 Colorado State Hazard Mitigation Plan for consistency. Included the potential for catastrophic releases from abandoned mines as a component of the hazardous materials hazard profile. Updated list of disaster declarations to include 2013-2018 data. Updated NCEI to include 2013-2018 data. Updated past occurrences for each hazard to include 2013-2018 data. Updated critical facilities identification from the 2013 plan. Updated growth and development trends to include Census 2010, American Community Survey 5-Year Estimates, 2013-2017 and local data sources. Updated historic and cultural resources using Colorado State Historic Preservation Office and other local/state/national sources. Updated property values for vulnerability and exposure analysis. Updated critical facilities and infrastructure data and lists, including alignment with FEMA Lifelines categories. Estimated flood losses using the Summit County FEMA flood hazard maps that became effective in 2018. Updated NFIP flood insurance policy data and Repetitive Loss structure data from the previous plan. Incorporated new hazard loss estimates since 2013, as applicable. Used updated data to assess wildfire threat to the County. Changes in growth and development were examined; as well as reductions in vulnerability accomplished by the County's wildfire mitigation efforts. A Hazus-MH Level I earthquake vulnerability analysis data was updated with Hazus Version 4.2 and incorporated. Updated information regarding specific vulnerabilities to hazards, including maps and tables of specific assets at risk, specific critical facilities at risk, and specific populations at risk; organized information into subsections on General Property, People, Critical Facilities and Infrastructure, Economy, Historic, Cultural, and Natural Resources, and Future Development. Developed a Risk Summary subsection to summarize problem statements and vulnerabilities. Updated maps in the plan where appropriate.

Plan Section	Update Review and Analysis
4.0 Mitigation Strategy	Reviewed mitigation capabilities and updated to reflect current capabilities. Indicated what projects have been implemented that may reduce previously identified vulnerabilities. Updated Chapter 4 based on the results of the updated risk assessment, completed mitigation actions, and implementation obstacles and opportunities since the completion of the previous plan. Reviewed goals and objectives to determine if they are still representative of the participants' mitigation strategy and aligned with the 2018 Colorado State Hazard Mitigation Plan goals. Revised the goals and objectives based on HMPC input. Revised to include more information on the Community Rating System (CRS) categories of mitigation measures (structural projects, natural resource protection, emergency services, etc.) and how they are reviewed when considering the options for mitigation. Included more information on how actions are prioritized. Reviewed mitigation actions from the 2013 plan and developed a status report for each; identified if action has been completed, deleted, or deferred. Identified "Mitigation Success Stories" to highlight positive movement on actions identified in 2013 plan. Identified and detailed new mitigation actions proposed by the HMPC.
5.0 Plan Maintenance	Reviewed and updated procedures for monitoring, evaluating, and updating the plan. Revised to reflect current methods. Updated the system for monitoring progress of mitigation activities by identifying additional criteria for plan monitoring and maintenance.
Jurisdictional Annexes	Revised annexes for participating jurisdictions in 2013 and included Summit Fire and EMS, a new participating jurisdiction to the HMP. Updated previous participants' annexes with the Colorado State Demographer data and the American Community Survey 5-Year Estimates, 2013-2017. Updated past event history and hazard loss estimates. Added new maps or updated old maps as needed. Updated mitigation actions from 2013 and added new mitigation actions.
Appendices	Appendix A – Updated references. Appendix B – Updated planning process documentation. Appendix C– Updated mitigation alternatives and prioritization. Appendix D – Updated Hazard Mitigation Planning Committee members Appendix E – Plan Adoptions - to capture adoption resolutions in 2020

2.3 Multi-Jurisdictional Participation

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

Summit County invited every incorporated town and special district in the County to participate in the multi-jurisdictional Summit County Multi-Hazard Mitigation Plan. The Disaster Mitigation Act requires that each jurisdiction participate in the planning process and officially adopt the multi-jurisdictional hazard mitigation plan. Each jurisdiction that chose to participate in the planning process and development of the plan update was required to meet strict plan participation requirements defined at the beginning of the process, which included the following:

- Designate a representative to serve on the HMPC
- Participate in HMPC meetings
- Complete and return updates on Mitigation Actions since 2013 to Wood
- Identify new mitigation actions for the plan
- Review and comment on plan drafts
- Inform the public, local officials, and other interested parties about the planning process and provide opportunity for them to comment on the plan
- Formally adopt the mitigation plan and re-adopt every 5 years

All of the jurisdictions with annexes to this plan met all of these participation requirements. An effort was made during the2020 update to increase the multi-jurisdictional participation, and Summit County Fire and EMS Authority was added to the plan in 2020. In most cases, the representative for each jurisdiction brought together a planning team to help collect data, identify mitigation actions and implementation strategies, and review annex drafts. Appendix D shows the attendance of representatives at each HMPC meeting; sign-in sheets are included in Appendix B Planning Process Documentation.

2.4 The 10-Step Planning Process

Wood and the Summit County Office of Emergency Management worked together to establish the framework and process for this planning effort using FEMA's *Local Multi-Hazard Mitigation Planning Guidance* (2013). The guidance and this plan are structured around a four-phase process:

1) Organize resources
2) Assess risks
3) Develop the mitigation plan
4) Implement the plan and monitor progress

Into this four-phase process, Wood integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the modified 10-step process used for this plan meets the funding eligibility requirements of the Hazard Mitigation Assistance grants (including Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, Flood Mitigation Assistance, Repetitive Flood Claims grants), Community Rating System, and the flood control projects authorized by the U.S. Army Corps of Engineers (USACE). Table 2-2 shows how the modified 10-step process fits into FEMA's four-phase process.

Table 2-2 Mitigation Planning Process Used to Develop the Plan

FEMA's 4-Phase DMA Process	Modified 10-Step CRS Process	FEMA Local Mitigation Planning Handbook Tasks
1) Organize Resources		
201.6(c)(1)	1) Organize the Planning Effort	1: Determine the planning area and resources
201.6(b)(1)	2) Involve the Public	2: Build the planning team - 44 CFR 201.6 (C)(1)
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies	3: Create an outreach strategy - 44 CFR 201.6(b)(1)
		4: Review community capabilities - 44 CFR 201.6 (b)(2)&(3)
2) Assess Risks		
201.6(c)(2)(i)	4) Identify the Hazards	5: Conduct a risk assessment - 44 CFR 201.6 (C)(2)(i) 44 CFR 201.6(C)(2)(ii)&(iii)
201.6(c)(2)(ii)	5) Assess the Risks	
3) Develop the Mitigation Plan		
201.6(c)(3)(i)	6) Set Goals	6: Develop a mitigation strategy - 44 CFR 201.6(c)(3)(i); 44 CFR 201(c)(3)(ii) and 44 CFR 201.6(c)(3)(iii)
201.6(c)(3)(ii)	7) Review Possible Activities	
201.6(c)(3)(iii)	8) Draft an Action Plan	
4) Implement the Plan and Monitor Progress		
201.6(c)(5)	9) Adopt the Plan	7: Review and adopt the plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan	8: Keep the plan current
		9: Create a safe and resilient community - 44 CFR 201.6(c)(4)

2.4.1 Phase 1 Organize Resources

Step 1: Organize the Planning Effort

Wood worked with the Summit County Office of Emergency Management to establish the framework and organization for the development of this plan and its update. The description of the planning process emphasizes the effort undertaken in the 2020 update. The original planning process effort is well documented and can be referenced in the 2008 plan and the 2013 planning process can be found in the 2013 update of this plan. The Summit County Emergency Manager took the lead on coordinating and reconvening the HMPC with the guidance of a professional planner from Wood during 2008, 2013 and again during the plan update in 2020. Wood and the Emergency Manager identified the key county, municipal, and other local government and initial stakeholder representatives. An email invitation was sent to them with a request to participate as a member of the HMPC and to attend a kickoff meeting. Representatives from the following County and municipal departments and special districts participated on the HMPC and the update of the plan:

Summit County

- Summit County Office of Emergency Management
- Summit County Environmental Health Department
- Summit County Information Systems (GIS) Department
- Summit County Community Development Divison
  - Summit County Planning Department
  - Summit County Building Department
- Summit County Public Works Divison
  - Summit County Engineering Deparment
  - Summit County Road & Bridge Department
- Summit County Sheriff's Office

Participating Jurisdictions

- Town of Blue River Manager's Office
- Town of Breckenridge Police Department
- Town of Breckenridge Public Works
- Town of Dillon Police Department
- Town of Dillon Public Works
- Town of Frisco Public Works
- Town of Frisco Community Development
- Town of Silverthorne Engineering
- Buffalo Mountain Metropolitan District
- Copper Mountain Consolidated Metropolitan District
- Hamilton Creek Metropolitan District
- Dillon Valley District
- Denver Water
- East Dillon Water District
- Mesa Cortina Water and Sanitation District
- Red, White, and Blue Fire Protection District
- Summit Fire & EMS*

* Quasi 'new' participating jurisdiction in 2020 as this incorporated the Lake Dillon Fire Protection District and the fire services of Copper Mountain Consolidated Metropolitan District

The Town of Montezuma and Snake River Water District were invited to participate but did not meet participation requirements during the 2020 update process. Their annexes are still part of this plan should they decide to update them individually or participate in planning efforts in the future.

The plan update process officially began with a kickoff meeting in Breckenridge, Colorado, on October 3, 2019. The Summit County Office of Emergency Management emailed letters of invitation to the kickoff meeting to county, municipal, district, state, and other stakeholder representatives. This list is included in Appendix D. Stakeholder participation was significant during the 2020 update; stakeholders are listed in subsection Step 3: Coordinate with Other Departments and Agencies.

The Disaster Mitigation Act requires that each jurisdiction participate in the planning process and officially adopt the multi-jurisdictional hazard mitigation plan and re-adopt during the update. A planning committee was created that includes representatives from each participating jurisdiction, departments of the County, and other local, state, and federal organizations responsible for making decisions in the plan and agreeing upon the final contents. Kickoff meeting attendees discussed potential participants and made decisions about additional stakeholders to invite to participate on the HMPC.

The HMPC contributed to this planning process by:

- Providing facilities for meetings,
- Attending meetings,
- Collecting data,
- Managing administrative details,
- Making decisions on plan process and content,
- Submitting mitigation action implementation worksheets,
- Reviewing and editing drafts, and
- Coordinating and assisting with public involvement and plan adoptions.

The HMPC communicated during the planning process with a combination of face-to-face meetings, phone interviews, email correspondence, and using a Google Drive folder hosted by Wood. Google Drive was utilized to share drafts of the plan and its annexes for jurisdictional review and input. Draft documents were typically posted in the Google Drive folder so that HMPC members could access and review them. The HMPC met three times during the planning period (October 3, 2019 to December 4, 2019). The meeting schedule and topics are listed in Table 2-3. The sign-in sheets and agendas for each of the meetings are included in Appendix B.

Table 2-3 Schedule of HMPC Meetings

Meeting	Topic	Date
Kickoff Meeting	Introduction to DMA and the planning process; Identification of hazards impacting Summit County	October 3, 2019
HMPC #2	Review of updated risk assessment; Review of goals and objectives	November 14, 2019
HMPC #3	Identification, prioritization, and status update of mitigation actions; Discussion of process to monitor, evaluate, and update plan	December 4, 2019

HMPC Meeting #1 – Kickoff Meeting

During the kickoff meeting, Wood 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. Wood also introduced the hazard identification requirements and data. The HMPC discussed past events and impacts and future probability for each of the hazards required by FEMA for consideration in a local hazard mitigation plan. The HMPC made one revision to the hazards list from the 2013 plan, to include Wildlife-Vehicle Collisions. Each jurisdiction provided updates directly to their respective annex and mitigation action trackers or provided information directly to Wood for incorporation into the plan update.

HMPC Meeting #2 – Risk Assessment and Goals Update

On November 14, 2019, the HMPC convened in person to discuss the results of the risk and vulnerability assessment update. Twenty-four (24) members of the HMPC were present for the discussion. Wood began the meeting with a presentation on the results the risk assessment for natural and human-caused hazards. A handout summarizing the hazard significance for each jurisdiction was shared for Planning Team to review. The group went through each hazard together and discussed the results as well as shared any local insight to inform the HIRA update. Refer to the meeting summary in Appendix B for notes related to each hazard discussed. Some of this discussion was also related to the capabilities assessment update.

Following the discussion on the results of the risk assessment, the group was provided a handout that summarized current goals and objectives from the County HMP, jurisdictional HMPs and the State HMP as well as the County's 2009 Comprehensive Plan. Wood explained this update process provides an opportunity to review the previous plan's goals to determine if they are still valid, comprehensive, and reflect current priorities and updated risk assessments. Revisions to the goal can be found in Chapter 4 Mitigation Strategy. The meeting ended with a review of the next steps and planning process schedule.

HMPC Meeting #3 – Mitigation Strategy Update Workshop

On December 4, 2019, the HMPC convened in person to identify new mitigation actions to include in the updated plan. This encompassed a review of possible mitigation activities, alternatives, and related climate adaptation strategies. The group also discussed criteria for mitigation action selection and prioritization. This was followed by a brainstorming session to elicit the development of new mitigation actions. Entities responsible for new mitigation action implementation were identified. A sticky dot exercise was used as an initial prioritization on the new mitigation actions (refer to the figure below). New mitigation action worksheets were distributed to allow additional details to be added following the workshop.

Figure 2-1 New Mitigation Actions Brainstorming Session

Source: Amy Carr, Wood, December 4, 2019

Step 2: Involve the Public

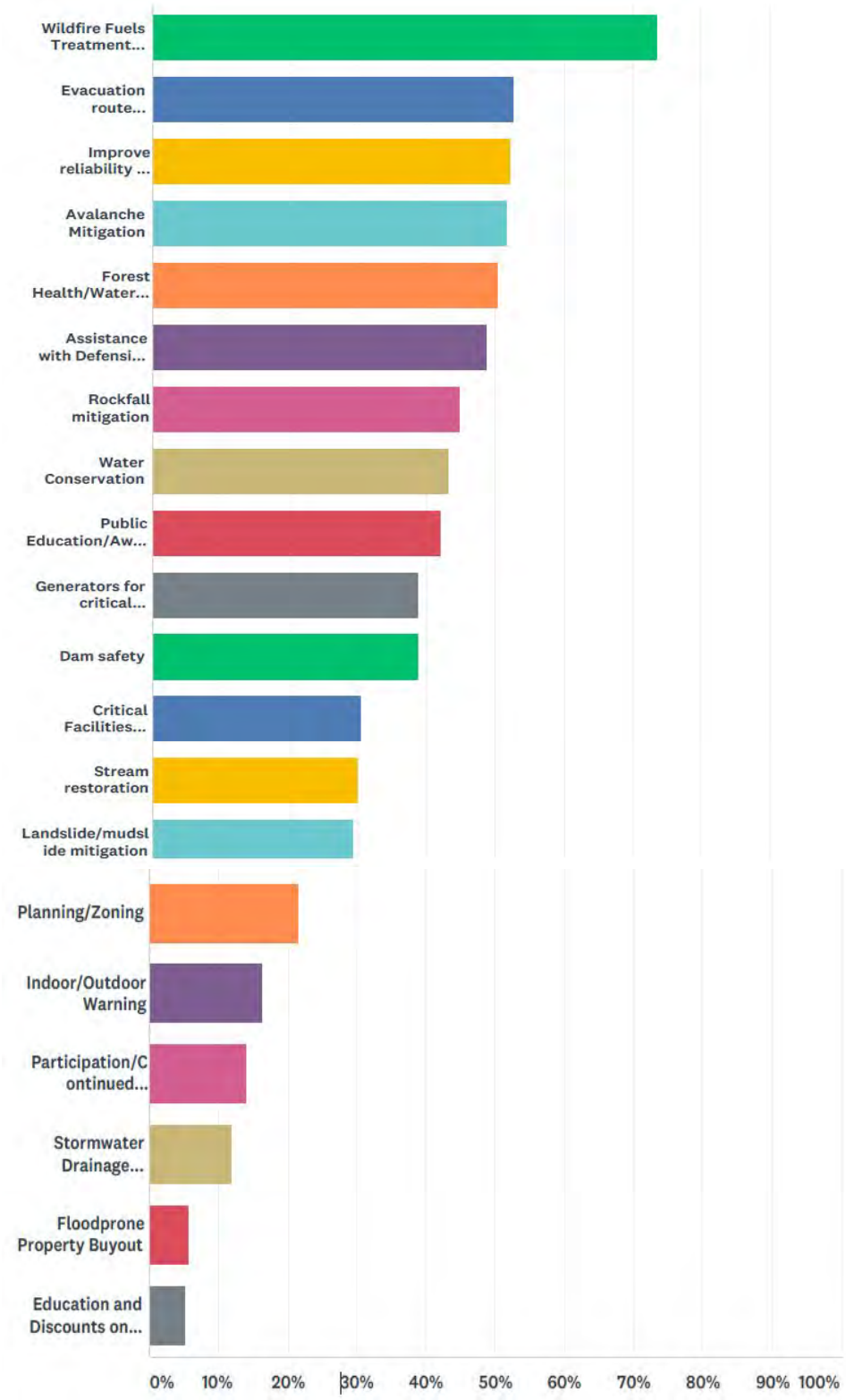
44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

At the kickoff meeting, the HMPC discussed options for soliciting public input on the mitigation plan and developed an outreach strategy by consensus. An online public survey was developed by Wood and shared with the HMPC to share through their respective channels. A link to the survey was posted on the County's and some of the participating jurisdiction's websites as well as through social media posts, screenshots from both can be found in Appendix B.

Online Public Survey

As noted above, during the plan update's drafting stage, an online public survey was developed as a tool to gather public input. The survey was for the public to provide feedback to the Summit County Multi-Jurisdictional Hazard Mitigation Planning Committee on 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 hazards and input on strategies to reduce their impacts. The survey was released in November and closed on December 18th. The HMPC provided links to the public survey by distributing it using social media, email, and posting the link on websites. Two hundred and eighty-one (281) people filled out the survey online. Results showed that the public perceives the most significant hazards to be avalanche, severe winter weather, dam incidents, and landslides/rock fall. Figure 2-3 shows the responses to question 3 of the survey, which solicited the public's opinion on the mitigation actions that should have the highest priority in the updated hazard mitigation plan. Wildfire fuels treatment projects, evacuation route development, improve reliability of communications systems, and avalanche mitigation were cited as the most popular mitigation actions. This information was shared with the HMPC during the update of the mitigation strategy as a source of potential mitigation ideas. A summary of all the survey data and documentation of the public feedback can be found in Appendix B.

Figure 2-2 Sample of Public Survey Responses



Public Review Period

The public was also given an opportunity to provide input on a draft of the complete plan prior to its submittal to the State and FEMA. Summit County provided the plan draft for review and comment on the County website. The plan was available from February 20 to March 3, 2020. Some participating jurisdictions announced the availability of the draft plan and the public comment period through social and traditional media announcements. Copies of these notices is provided in Appendix B. An online form to collect comments was posted with the plan. The plan was reviewed by 13 people; most identified themselves as being members of the public (11) one individual identified as being local government and one individual identified as being affiliated with a nonprofit. Only one comment was received which is documented in Appendix B. Comments from the public review were shared with the HMPC and resulted in minor edits related to flood hazards in Chapter 3 Risk Assessment. Another comment noted that the plan was "very thorough".

Step 3: Coordinate with Other Departments and Agencies

44 CFR Requirement 201.6(b): 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: (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 non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

There are numerous organizations whose goals and interests interface with hazard mitigation in Summit County. Coordination with these organizations and other community planning efforts is vital to the success of this plan update. The Summit County Office of Emergency Management invited other local, state, and federal departments and agencies to the kickoff meeting to learn about the hazard mitigation planning initiative. Many of the agencies participated throughout the planning process in meetings described in Step 1: Organize the Planning Effort.

In addition, the HMPC developed a list of neighboring communities and local and regional agencies involved in hazard mitigation activities, as well as other interested parties to keep informed on the plan update process. At the Kickoff Meeting the County Director of Emergency Management noted upcoming meetings with the Colorado Avalanche Information Center (CAIC) and the County's Local Emergency Planning Committee (LEPC) where he would inform the groups of the update process and invite to provide input to the HMPC.

Stakeholders include local and regional agencies involved in hazard mitigation activities or those beyond the County and local government that have the authority to regulate development. Stakeholders could participate in various ways, either by contributing input at HMPC meetings, being aware of planning activities through an email group, providing information to support the effort, or reviewing and commenting on the draft plan. Based on their involvement in other hazard mitigation planning efforts, and status in the County, representatives from the following agencies and organizations were invited to participate as stakeholders in the process; an asterisk indicates they participated in HMPC meetings:

- Other Government and Stakeholder Representatives
- Colorado Division of Homeland Security and Emergency Management*
- Colorado Department of Transportation*
- Colorado State University Extension*

- Colorado State Forest Service
- U.S. Forest Service*
- U.S. Bureau of Reclamation
- Lake County Emergency Management
- Park County Emergency Management
- Grand County Emergency Management
- Eagle County Emergency Management
- Clear Creek County Emergency Management
- Middle Park Conservation District
- FEMA Region VIII*
- Vail Resorts Management Company*
- Arapahoe Basin Ski Area*
- Keystone Resort*
- Copper Mountain Resort*
- Keystone Science School*
- Summit Foundation *
- Xcel Energy*
- Water Solutions, Inc.*

As noted by the asterisks (*) next to the above names, many of these groups found it beneficial to participate on the HMPC or attend public meetings. Further as part of the both HMPC and public outreach processes, all groups were invited to review and comment on the plan prior to submittal to Colorado DHSEM and FEMA.

As part of the public review and comment period for the draft plan, key agencies were again specifically solicited to provide any final input to the draft plan document. This input was solicited both through membership on the HMPC and by direct emails to key groups and associations to review and comment on the plan. As part of this targeted outreach, these key stakeholders were also specifically invited to attend the HMPC and public meeting to discuss any outstanding issues and to provide input on the draft document and final mitigation strategies. This process accomplished as part of planning steps two and three in the FEMA Local Mitigation Planning Handbook.

Incorporation of Existing Plans and Other Information

The coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards. Summit County uses a variety of mechanisms to guide growth and development. Integrating existing planning efforts, mitigation policies, and action strategies into this plan establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development and update of this plan involved a comprehensive review of existing plans, studies, reports, and initiatives from Summit County and each participating municipality that relate to hazards or hazard mitigation. A high-level summary of the key plans, studies and reports is summarized in the table below. Information on how they informed the update are noted and incorporated where applicable.

Table 2-4 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Plan informed LHMP
Summit County Comprehensive Plan (2009)	Provided background information on the county including some information related to jurisdictions. Informed the Community Profile in Chapter 1 and the jurisdictional annexes.
Blueprint Silverthorne Comprehensive Plan Update (2014)	Provided background information on the Town of Silverthorne. Informed the Silverthorne annex.
Joint Upper Blue Master Plan (2011)	Provided background information for the Town of Breckenridge, the Town of Blue River and unincorporated areas for Summit County.
Town of Blue River Comprehensive Plan	Provided background information on the Town of Blue River. Informed the Blue River annex.
Summit County Hazard Mitigation Plan (2013)	Informed the updated risk assessment.
Colorado State Hazard Mitigation Plan (2018)	Informed the HIRA (Chapter 3) with risk information specific to Summit County and hazard profile information for each of the hazards including the new Wildlife-Vehicle Collision hazard.
State Demography Office Demographic Profiles	Informed the Community Profile and each of the incorporated jurisdictional annexes.
Summit County Flood Insurance Study	Reviewed for information on past floods and flood problems to inform risk assessment (Chapter 3) Utilized Digital Flood Insurance Rate Maps effective November 2018 to update maps and flood risk assessment in Chapter 3.
Grand County Hazard Mitigation Plan (2013)	Informed the hazard profile for Wildlife-Vehicle Collisions (new to the 2020 plan).
Summit County Community Wildfire Protection Plan (2016)	Informed the hazard profile and vulnerability assessment for the Wildfire section and in the jurisdictional annexes.
Mesa Cortina/Summit County Open Space Wildfire Mitigation Plan (2018)	Informed the vulnerability assessment for wildfire risk in Chapter 3 and in the Annex L Water and Sanitation District's specific to the Mesa Cortina Water District.
Colorado State Forest Service - 2018 Report of The Health of Colorado's Forests	Informed the pest infestation, specifically to forest pests hazard profile and risk assessment. Provided background information on successful wildfire mitigation before the Buffalo Mountain Fire.
Swift-Water Safety & Flood Preparedness Guide	Provided background information on flood and swift-water risk in the County.
Summit County Climate Action Plan: Strategies for a Sustainable Future (2018)	Informed the climate change considerations in Chapter 3 risk assessment.
Summit County Safe Passage: A County-wide Connectivity Plan for Wildlife (2017)	Informed the Wildlife-Vehicle Collisions profile and risk assessment.
Summit Fire and EMS Strategic Plan 2018-2022	Provided background information on Summit Fire & EMS and was included in the Fire Districts annex.

Plan, Study, Report Name	How Plan informed LHMP
History of Colorado Avalanche Accidents 1859-2006	Informed the avalanche hazard profile in Chapter 3 risk assessment.
Colorado State Drought Response and Mitigation Plan (2018)	Informed the drought hazard profile and vulnerability assessment in Chapter 3 risk assessment.
Colorado Water Conservation Board – Colorado Water Availability Study (2018)	Informed the drought hazard vulnerability assessment in Chapter 3 risk assessment.
Summit County Land Use and Development Code	Informed the County's capabilities assessment.

Other technical data, reports and studies were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Information from the following agencies and groups were reviewed in the development and update of this plan. Specific references relied on in the development of this plan are also sourced throughout the document as appropriate. These sources are documented throughout the plan and specifically in the capability assessment sections of each jurisdictional annex.

- Colorado Geological Survey
- U.S. Geological Survey
- National Oceanic and Atmospheric Administration's (NOAA) National Center for Environmental Information (NCEI)
- U.S. Department of Agriculture (USDA) – Farm Service Agency (FSA)
- Headwaters Economics
- U.S Census Bureau
- FEMA Community Information System
- U.S Forest Service
- Colorado State Forest Service
- National Register of Historic Places
- Western Regional Climate Center
- Summit Daily
- The Denver Post
- Colorado Avalanche Information Center (CAIC)
- Colorado Division of Water Resources – Dam Safety
- Center for Snow and Avalanche (CSAS) – Colorado Dust-on-Snow Program (CODOS)
- Colorado Department of Transporation (CDOT)
- Colorado Parks and Wildlife
- U.S Army Corp of Engineers'(USACE) National Inventory of Dams (NID)
- USACE Ice Jam Information Clearinghouse
- National Drought Mitigation Center – Drought Impact Reporter
- U.S. Drought Monitor
- Colorado Earthquake Information Database
- Western Water Assessment Program
- U.S. Department of Transporation (DOT)
- U.S. Environmental Protection Agency (EPA)
- U.S. Coast Guard's National Response Center (NRC)
- Colorado Department of Public Health and Environment (CDPHE)
- Colorado Division of Reclamation, Mining, and Safety (DRMS)
- National Fire Protection Association (NFPA)

- National Interagency Fire Center
- National Weather Service
- Federal Wildland Fire Occurrence Database
- Colorado Wildfire Risk Assessment Portal (CO-WRAP)

Integration of 2013 Plan into Other Plans and Planning Mechanisms

In addition, the 2013 hazard mitigation plan was incorporated into several County plans and planning mechanisms. The risk assessment informed the update of the Summit County Community Wildfire Protection Plan (CWPP) in the revised version of the plan in 2016 and the readopted plan in 2018. Several wildfire mitigation actions were proposed in the CWPP and reviewed during this planning process.

Refer to each jurisdictional annex for additional information on how each jurisdiction integrated 2013 risk information into their planning mechanisms. As well as the process that will be used moving forward to integrate risk information from this plan update process.

2.4.2 Phase 2 Assess Risk

Step 4: Identify the Hazards

Wood led the HMPC in an effort to review the list of hazards identified in the 2013 plan and document all the hazards that have, or could, impact the planning area, including documenting recent avalanche, wildfire, flood, and winter storm events. The HMPC refined the list of hazards to make it relevant to Summit County. The profile of each of these hazards was then developed and updated in 2020 with information from the HMPC and additional sources. Web resources, existing reports and plans, and existing GIS layers were used to compile information about past hazard events and determine the location, previous occurrences, probability of future occurrences, and magnitude/severity of each hazard. Information on the methodology and resources used to identify and profile hazards is provided in Sections 3.1-3.2.

Step 5: Assess the Risks

After profiling the hazards that could affect Summit County, the HMPC collected information to describe the likely impacts of future hazard events on the participating jurisdictions. This step included two parts: a vulnerability assessment and a capability assessment.

Vulnerability Assessment—Participating jurisdictions inventoried their assets at risk to natural hazards—overall and in identified hazard areas. These assets included total number and value of structures; critical facilities and infrastructure; natural, historic, and cultural assets; and economic assets. The HMPC also analyzed development trends in hazard areas. The County's DFIRM was used to refine the estimated flood losses during the update, where available for the NFIP participating communities.

Capability Assessment—This assessment consisted of identifying the existing mitigation capabilities of participating jurisdictions. This involved collecting information about existing government programs, policies, regulations, ordinances, and plans that mitigate or could be used to mitigate risk to disasters. Participating jurisdictions collected information on their regulatory, administrative, fiscal, and technical capabilities, as well as ongoing initiatives related to interagency coordination and public outreach. This information is included in the jurisdictional annexes.

A more detailed description of the risk assessment process and the results are included in Chapter 3 Risk Assessment.

2.4.3 Phase 3 Develop the Mitigation Plan

Step 6: Set Goals

Wood facilitated a brainstorming and discussion session with the HMPC during their second meeting to identify goals and objectives for the overall multi-jurisdictional mitigation plan update. The HMPC discussed definitions and examples of goals, objectives, and actions and considered the goals of the state hazard mitigation plan and other relevant local plans when forming their own goals and objectives. The HMPC determined that the goals and objectives from the 2013 plan were still relevant; they remained unchanged except for a minor edit to reflect that the plan includes human-caused hazards in addition to natural hazards. The group discussed the ideas and came to consensus on the final goals and objectives for the multi-jurisdictional plan update, which are further discussed in Chapter 4.

Step 7: Review Possible Activities

The HMPC identified and prioritized mitigation actions at their third meeting. The group was presented with six different categories of mitigation actions and example actions for each identified hazard. The HMPC then participated in a brainstorming process, in which committee members identified actions to address each of the plan's four goals. The HMPC then reviewed potential mitigation alternatives and identified new actions by hazard and jurisdiction to ensure that all of the plan's profiled hazards were addressed and that all participating jurisdictions had at least one mitigation action.

The HMPC discussed criteria for narrowing down and prioritizing the identified actions. The group approved the STAPLEE criteria, which assesses the social, technical, administrative, political, legal, economic, and environmental implications of each action. Each member used these criteria to vote for their highest priority projects. Projects were then sorted into high, medium, or low priority based upon the number of votes they received. This process is described in more detail in Chapter 4 Mitigation Strategy.

The HMPC also identified the responsible agency for implementing each action. The identified agencies then completed a mitigation action implementation worksheet for each action. The purpose of these worksheets is to document background information, ideas for implementation, alternatives, responsible agency, partners, potential funding, cost estimates, benefits, and timeline for each identified action.

Each jurisdiction was responsible for completing mitigation action implementation worksheets for each action identified by the HMPC that they would need to implement on the jurisdictional level. The jurisdictions were also responsible for working with their local staff to submit additional mitigation actions unique to their jurisdiction. Each jurisdiction provided input on the progress made on actions identified in the 2013 plan.

Step 8: Draft the Plan

The first complete draft of the plan update, including annexes for new and past participating jurisdictions, were developed and submitted to the HMPC for review in January 2020. Once the committee's comments were incorporated, a complete draft of the plan was made available online and in hard copy for review and comment by the public and other agencies and interested stakeholders. This review period was from February 20-March 3, 2020. Methods for inviting interested parties and the public to review and comment on the plan were discussed in Steps 2 and 3, and materials are provided in Appendix B. Comments were

integrated into a final draft for submittal to the Colorado Department of Homeland Security and Emergency Management, and FEMA Region VIII.

2.4.4 Phase 4 Implement the Plan and Monitor Progress

Step 9: Adopt the Plan

To secure buy-in and officially implement the plan, the governing bodies of each participating jurisdiction adopted the plan and their jurisdictional annex. Scanned copies of resolutions of adoption are included in Appendix E – Local Plan Adoptions.

Step 10: Implement, Evaluate, and Revise the Plan

Chapter 5 describes how the HMPC developed and agreed upon an overall strategy for plan implementation and for monitoring and maintaining the plan. This process was reviewed during Meeting #3. In general, this process was found to be effective and received minor updates during the 2020 planning process.

3 Risk Assessment

Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage." This chapter will examine hazards and vulnerability. Jurisdictional annexes to the plan discuss the capabilities for each of the participating jurisdictions as well as the hazards and vulnerability particular to their area.

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The goal of the risk assessment is to estimate the potential loss in Summit County, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows communities in Summit County to better understand their potential risk to natural 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 2013 FEMA Local Mitigation Planning Handbook, which recommends a four-step process for conducting a risk assessment:

1) Identify Hazards
2) Profile Hazard Events
3) Inventory Assets
4) Estimate Losses

This chapter is divided into three parts: hazard identification, hazard profiles, and vulnerability assessment:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- **Section 3.2 Hazard Profiles** discusses the geographic location, past events, future probability, magnitude/severity, and overall vulnerability of the planning area to each hazard. Climate change considerations and how the frequency and severity of the hazard might change in the future was added during the 2020 update.
- **Section 3.3 Vulnerability Assessment** assesses the County's exposure to natural hazards and considers assets at risk, including critical facilities and infrastructure; natural, historic, and cultural resources; and economic assets. This section also describes vulnerability and estimates potential losses to structures in identified hazard areas and addresses development and land use trends.

3.1 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.

During the 2020 planning process, the Summit County Hazard Mitigation Planning Committee (HMPC) revisited data and discussed the impacts of each of the hazards listed alphabetically below, to determine the current hazards that threaten the planning area.

- Avalanche
- Dam Failure Incidents
- Drought
- Earthquake
- Erosion/ Deposition
- Flood
- Hazardous Materials Release
- Landslide/ Mudflow/ Debris Flow/Rock Fall
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildfire
- Wildlife/ Vehicle Collisions
- Windstorm

The HMPC eliminated some hazards from further profiling because they do not occur in the planning area or their impacts were not considered significant in relation to other hazards. Table 3-1 lists these hazards and provides a brief explanation for their elimination.

Table 3-1 Hazards Not Profiled in the Plan

Hazard	Explanation for Omission
Coastal Storm	Planning area is not near coastal areas.
Expansive Soils	Expansive soils are not a common soil type in the planning area and the HMPC was unaware of past impacts.
Extreme Heat	The hazard has not created problems in the past. Due to the high altitude and alpine environment of Summit County temperatures are rarely hot enough to affect human health.
Hailstorm	Hailstorms occur, but large-sized damaging hail similar to that occurring on the Front Range of Colorado is very rare. Past damage has been negligible.
Hurricane	Planning area is not near coastal areas.
Land Subsidence	Hazard is primarily related to coal mining in Colorado (i.e. mine subsidence). There are no coal mines in Summit County. The HMPC are unaware of areas of concern or past impacts.
Tornado	Past events have been rare and weak in strength (F0). Wind damages are addressed in the profile for windstorm.
Tsunami	Planning area is not near coastal areas.
Volcano	Dotsero, near Glenwood Canyon, is the only volcano of concern in Colorado. It has not erupted in 4,000 years.

The list of hazards changed slightly from the 2013 plan update process, as Wildlife-Vehicle Collisions was added as a hazard to be included with the 2020 update to align with the Colorado State Hazard Mitigation Plan (SHMP 2018), the neighboring Grand County Hazard Mitigation Plan, as well as reflect ongoing mitigation efforts within the County. The Mountain Pine Beetle hazard was changed to Pest Infestation (forest/aquatic) to account for broader forest and aquatic pests. Forest pests have had widespread effect on the lodgepole and other pine tree populations in the County, relate to wildfire risk, and have secondary risks associated with the potential for tree blowdown hazards. In addition, aquatic pests potentially pose issues with local water supply, recreation and water infrastructure and are hence

also described under the Pest Infestation chapter. Although not required by the Disaster Mitigation Act, the HMPC decided to address one human-caused hazard—Hazardous Materials Release.

All hazards to be included in this plan update are profiled in further detail in the next section and listed in Table 3-2 along with their significance ratings. Hazard tables for the special districts and incorporated jurisdictions are included in their individual annexes.

Table 3-2 Hazard Significance Summary for Summit County

Hazard	Spatial Extent	Probability of Future Occurrence	Magnitude/ Severity	Overall Significance
Avalanche	Isolated	Highly Likely	Critical	High
Flood	Small	Likely	Critical	High
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Highly Likely	Catastrophic	High
Drought	Large	Likely	Limited	Medium
Dam Failure	Medium	Unlikely	Catastrophic	Medium
Hazardous Materials Release (Transportation)	Isolated	Likely	Catastrophic	Medium
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Occasional	Critical	Medium
Lightning	Large	Highly Likely	Critical	Medium
Pest Infestation (Forest and Aquatic)*	Large	Likely	Limited	Medium
Earthquake	Large	Occasional	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Windstorm	Medium	Likely	Limited	Low
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low

Spatial Extent (geographic area)
Large – More than 50% of the planning area affected
Medium – 25-50% of the planning area affected
Small – 10-25% of the planning area affected
Isolated – Less than 10% of planning area affected

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

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

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

Source: Summit County Hazard Mitigation Planning Committee, 2020

* Note that aquatic hazards are prevalent in areas such as Dillon Reservoir and Green Mountain Reservoir where large water features are present.

Data on the past impacts and future probability of these hazards was collected from a variety of sources including the following listed below. GIS data sources are described in more detail under Section 3.3 Vulnerability Assessment.

- Summit County HMPC
- FEMA
- Colorado Geological Survey
- State of Colorado Hazard Mitigation Plan (2018)
- The National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI)
- Disaster declaration history from FEMA, the Public Entity Risk Institute, Colorado Governor Executive Orders, and the U.S. Department of Agriculture (USDA) Farm Service Agency

3.1.1 Disaster Declaration History

One method used by the HMPC to identify hazards was to examine events that triggered federal and/or state disaster declarations. Federal and/or state 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 USDA's Farm Service Agency (FSA), 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.

Table 3-3 lists state and federal disaster declarations received by Summit County. Many of the disaster events were regional or statewide; therefore, reported details may not be accurate reflections of full effects in Summit County and its communities (e.g. the Hurricane Katrina Coastal Storm event).

Since 1977 there have been 7 drought declarations issued by the USDA's Secretary of Agriculture in Summit County, 5 of which were Fast Track Secretarial disaster designations. According to the Secretary of Agriculture, a Fast Track designation is for a severe drought and provides an automatic designation when, during the growing season, any portion of the county meets the severe drought intensity value for eight consecutive weeks or more. Refer to the Drought hazard profile for more information of Disaster Declarations from the Secretary of Agriculture related to drought events.

This disaster history including 11 events (combined federal and state) suggests that Summit County experiences a major event worthy of a disaster declaration every 3.8 years, though this is somewhat skewed by the multiple USDA Fast Track declarations that can occur during a drought year.

Table 3-3 Disaster Declaration History in Summit County, 1977-Present

Date Declared	Declaration Type	Incident/Hazard Type	Disaster Number
1/29/1977	FEMA Emergency Declaration	Drought	EM 3025
6/19/2002	FEMA Disaster Declaration	Wildfire	DR 1421
4/9/2003	FEMA Emergency Declaration	Snow	EM 3185
9/5/2005	FEMA Emergency Declaration	Coastal Storm (Hurricane Katrina Evacuation)	EM 3224
7/3/2012	USDA, Primary Designation	Drought, Excessive Heat, High Winds	S3260
1/9/2013	USDA, Secondary Designation	Drought-FAST TRACK	S3456
8/28/2013	USDA, Secondary Designation	Drought-FAST TRACK	S3575
7/19/2017	Governor Declaration	Wildfire	D-2017-018
9/12/2018	USDA, Primary Designation	Drought-FAST TRACK	S4386
3/22/2019	USDA, Secondary Designation	Drought-FAST TRACK	S4468
5/30/2019	USDA, Primary Designation	Drought-FAST TRACK	S4481

Source: State of Colorado archives for Governor Executive Orders and Disaster Declarations 2019; FEMA 2019; USDA FSA 2019; CO Hazard Mitigation Plan 2018.

More than half of the declarations were for, or included, drought (seven out of eleven noted declarations). Summit County was included in the Presidential Major Disaster Declaration for wildfire in 2002; however; major fires or losses were not sustained in the County itself. The County provided aid to affected areas, but no reimbursement was involved. Then, the Peak 2 Fire in 2017 led to a governor declaration in the County, under disaster number D-2017-018. Other noted declarations include the Hurricane Katrina Evacuation event in 2005, and the 2003 FEMA Emergency Declaration for Snow hazards.

It is important to be aware that hazard events that happen outside of the County boundaries also can have direct and indirect impacts to Summit County. For instance, transportation routes or power supply could be interrupted by severe winter storms or wildfire hazards outside of the County.

3.2 Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

The hazards identified for inclusion in the current plan update process and summarized in Section 3.1 Hazard Identification are profiled individually in this following section. The 3.2 section will conclude by summarizing the probability of future occurrence and potential magnitude of each hazard for each jurisdiction, as well as assigning an overall vulnerability, or planning significance rating, of high, moderate, or low for each hazard. Climate change considerations are also discussed by hazard where applicable. Detailed profiles for each of the identified hazards include information on the following characteristics of the hazard:

Hazard Description

This sub-section consists of a general description of the hazard and the general impacts it may have on a community.

Geographic Location

This sub-section describes the geographic coverage or location of the hazard in the planning area, and assesses the affected areas as isolated, small, medium, or large.

- **Large**—More than 50% of the planning area affected
- **Medium**—25-50% of the planning area affected
- **Small**—10-25% of the planning area affected
- **Isolated**—Less than 10% of the planning area affected

Previous Occurrences

This sub-section includes information on historic hazard incidents, including impacts and costs, if known, to the planning area. Information from the HMPC was combined with other data sources as available (e.g. federal and state declaration history).

Probability of Future Occurrence

The frequency of past events and input from the HMPC's experience is used to gauge the likelihood of future occurrences. Based on historical data, the Probability of Future Occurrence is categorized as follows:

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

Magnitude/Severity

This section summarizes the magnitude/severity (extent) of a hazard event in terms of deaths, injuries, property or other damage, and interruption of essential facilities and services. Magnitude/severity is classified in the following manner:

- **Catastrophic**—Multiple deaths; property destroyed and severely damaged; and/or interruption of essential facilities and service for more than 72 hours.
- **Critical**—Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours.
- **Limited**—Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours.
- **Negligible**—No or few injuries or illnesses; minor quality of life loss; little or no property damage; and/or brief interruption of essential facilities and services.

Climate Change Considerations

This sub-section is new to the 2020 hazard mitigation plan update cycle. This sub-section is meant to describe the potential for climate change to affect the frequency, intensity, or even location of the hazard in the future.

3.2.1 Avalanche

Hazard Description

Avalanche hazards occur predominantly in the mountainous regions of Colorado above 8,000 feet. The vast majority of avalanches occur during and shortly after winter storms. Avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. While most avalanches are caused simply by the weight of accumulated snow, other triggers can be a human (e.g., skier, snowshoer, snowmobiler), and animals.

The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement creates an avalanching episode. According to the Colorado Avalanche Information Center (CAIC), about 90% of all avalanches start on slopes of 30-45 degrees, while about 98% of all avalanches occur on slopes of 25–50 degrees. Avalanches release most often on slopes above timberline that face away from prevailing winds (leeward slopes collect snow blowing from the windward sides of ridges). Avalanches can run, however, on small slopes well below timberline, such as gullies, road cuts, and small openings in the trees. Very dense trees can anchor the snow to steep slopes and prevent avalanches from starting; however, avalanches can release and travel through a moderately dense forest. An average-sized avalanche travels around 80 miles mph, and the typical range of impact pressure from an avalanche is from 0.5 to 5.0 tons per foot.

Historically in Colorado, avalanches have occurred during the winter and spring months between November and April. The avalanche danger increases with major snowstorms and periods of thaw. About 2,300 avalanches are reported to the CAIC in an average winter. More than 80% of these fall during or just after large snowstorms. The most avalanche-prone months are, in order, February, March, and January, but avalanches caused by thaw occur most often in April.

Geographic Location

The geographic extent of this hazard in Summit County is **isolated**—less than 10% of the planning area affected—as displayed in Figure 3-1 which shows the avalanche paths in area, based on the Colorado Avalanche Information Center (CAIC), current as of December of 2019. However, portrayed in Figure 3-2 below are the avalanche forecast zones in Colorado, with the Vail/Summit County zone enclosed in a blue square for reference. This zone encompasses the entire County as well as part of Eagle County to the west. Smaller portions of Grand and Routt County are contained in the forecast zone as well.

The prevailing winds in the region are westerlies, and most slides start on the lee (downwind) or eastern side of ridges where snow accumulates, such as on the east side of the Ten Mile Range in the southern part of the County. Avalanches and fatalities have occurred on Quandary Peak in the Ten Mile Range and in the Arapahoe Basin ski area and surrounding backcountry terrain in the eastern part of the County near Loveland Pass (see Previous Occurrences).

The most severe avalanche terrain in Summit County is on federal lands. Unincorporated Summit County is the jurisdiction with the most avalanche risk. However, highway closures due to an event can affect all participating jurisdictions.

Figure 3-1 Colorado Avalanche Paths in Summit County, based on the CAIC

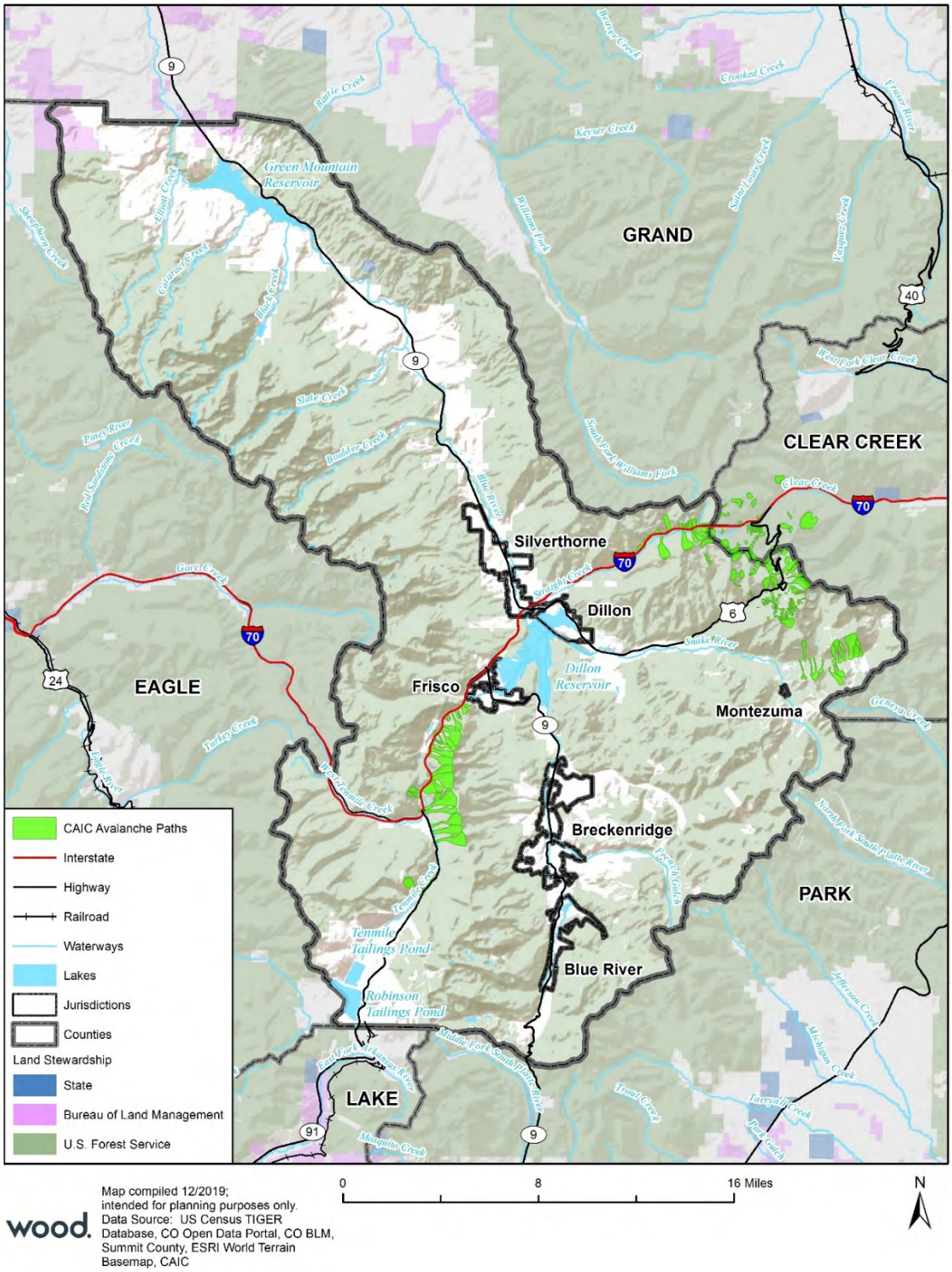
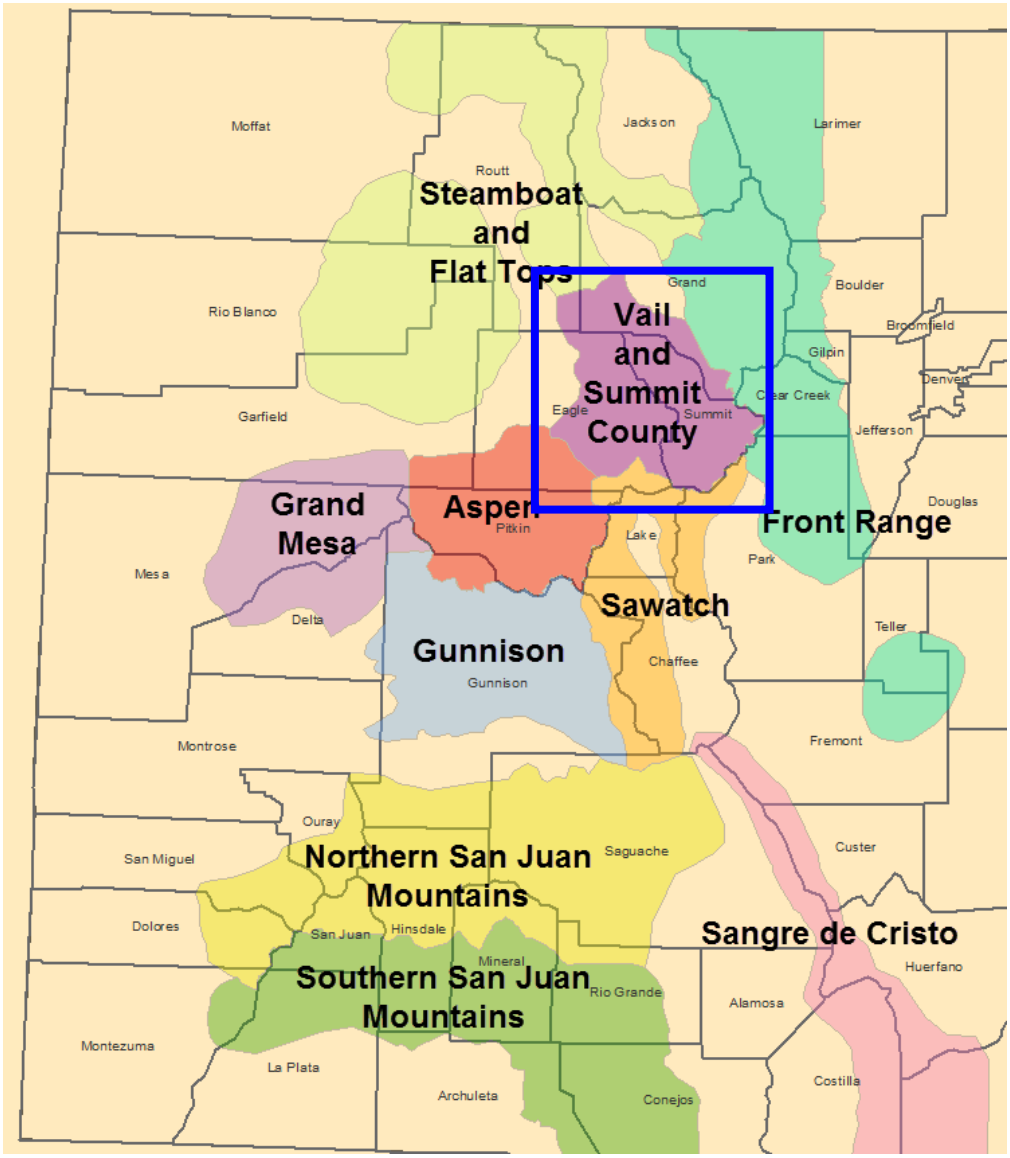


Figure 3-2 Colorado Avalanche Forecasts Zones and the Vail and Summit County Zone



Source: Colorado Avalanche Information Center (CAIC)

Previous Occurrences

According to information from a *History of Colorado Avalanche Accidents, 1859–2006*, there were 58 avalanche-related deaths in Summit County between 1859 and 2006. The National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) database and the CAIC have information on 26 notable avalanches (e.g., avalanches that involved people) that occurred in Summit County between 1987 and October of 2019. All the aforementioned records which led to injuries, deaths, major damages, or closures are summarized below.

- **March 3 and 7, 2019**—Media broadcasts reported avalanches on March 3rd and March 7th which swept across Interstate-70 in the Ten Mile Canyon between Frisco and Copper Mountain and trapped

vehicles in several inches of avalanche debris. Fortunately, no injuries or property damages were reported but a large stretch of I-70 required closing down for several hours due to avalanche mitigation work.

- **February 10, 2014**—Two skiers exited the Keystone Ski Resort and descended into the North Fork of Swan River. They triggered a moderate sized avalanche that ran about 1,500 vertical feet. One skier was partially buried but was able to dig himself out. The other skier was completely buried, and his body was recovered the following day. The victim was buried in approximately 4.6 feet of snow, in a small stand of trees. This avalanche event was reported by the U.S. Forest Service and led to the death of 1 person.
- **April 20, 2013**—Five people were killed in the deadliest avalanche in Colorado in 50 years. It occurred near Sheep Creek, north of Loveland Pass (Clear Creek County) on Mount Sniktau but involved Summit County first responders. A series of rapid, heavy April storms created conditions for a deep-slab avalanche cycle in the Front Range and Vail-Summit CAIC forecast zones. A sixth person was rescued and survived the event. All six individuals were experienced skiers and snowboarders, taking part in the Rocky Mountain High Backcountry Gathering focused on backcountry snowboarding and avalanche safety. The avalanche was a hard slab, triggered by one or more party members as they were traversing the drainage at the bottom of the slope. The avalanche was medium sized.
- **February 19, 2013**—A skier on Peak 1 triggered a slide but managed to avoid being trapped.
- **February 16, 2013—**A slide occurred west of the Montezuma Bowl at the A-Basin ski area, nearly trapping a group of 15 skiers. 6 were partially buried and 1 was fully buried. 4 people sustained injuries, but fortunately no one was killed. There had been significant snowfall from a recent storm plus unstable snowpack due to snow conditions over the season. The same day in the North Bowl in Keystone, an avalanche occurred when a cornice released.
- **January 25, 2012—**Four snowboarders were riding in the Deer Creek Drainage above Montezuma. One snowboarder was caught and carried by an avalanche but not injured.
- **April 29, 2011—**A large hard slab avalanche release off of a subpeak between Tip Top and Morgan above Peru Creek. It wasted a large area of mature forest, with some tree ring counts indicating trees over 300 years old were uprooted and destroyed. The avalanche hit Tower 73 on the Shoshone Line 100,000 volt power line that runs from the Shoshone power station in Glenwood Canyon and over the Continental Divide above Peru Creek before continuing to Denver. The estimated cost to repair this line was $250,000. The line was built in 1908 and has been impacted by avalanches before. The tower was repaired by an Xcel Energy crew. The tower was also relocated to the eastern flank of the avalanche path.
- **April 1, 2011—**A skier and snowboarder were riding near Devil's Tool near A-Basin. Both individuals were caught, with one fully buried. The skier broke a leg in the incident. The snowboarder was extracted and sustained no serious injuries.
- **March 10, 2010—**Three snowboarders were riding near Steep Gully #1, a backcountry area near A-Basin. After the avalanche triggered, one rider was caught and carried for most of the avalanche's run. He was partially buried and did not survive the incident.
- **February 14, 2010—**Two snowboarders were riding the "No Brain" gully near MM 224 at Loveland Pass to get from an upper part of Highway 6 to a lower part. One rider triggered an avalanche and was caught and partially buried. Neither snowboarder was seriously injured.
- **January 8, 2008—**Two skiers were riding Dave's Wave at Loveland Pass. The two triggered an avalanche. Neither skier was injured, but a dog was caught, buried, and killed.
- **December 31, 2006—**Two hikers, a father and son, were attempting to climb Torreys from the top of Loveland Pass via Grizzly Peak. An avalanche triggered and caught both hikers. The father was

partially buried and was able to dig himself out. He was able to rescue his son who had been fully buried. Neither was seriously injured.

- **May 20, 2005**—A 53-year-old skier from Boulder was buried and killed in a medium-sized wet slab avalanche at Arapahoe Basin. The avalanche occurred in an area known as the First Alley, immediately below the roll on the west side of the Pallavicini Run.
- **May 18, 2005**—A backcountry snowboarder triggered a small slab avalanche on the north side of Buffalo Mountain. He received leg and facial injuries.
- **March 24, 2005**—Two climbers were caught in an avalanche on the south side of Quandary Peak, about 6.5 miles south southwest of Breckenridge. One man survived with only minor injuries; the other was buried and killed. Figure 3-3 displays an image related to this event.
- **March 10, 2004**—A snowmobiler was killed in an avalanche on Mt. Guyot.
- **March 20, 2003**—Two out-of-area skiers were caught in an avalanche on Porcupine Peak west of Loveland Pass. One was injured, the other killed.
- **November 11, 2002**—Two climbers were caught, and one was seriously injured when swept down the south side of Quandary Peak.
- **February 2, 2002**—A snowmobiler triggered an avalanche on Mt. Guyot that left him buried up to his neck in snow. He was rescued by friends.
- **April 3, 2001**—A snowmobiler was buried and killed in an avalanche east of the Copper Mountain ski area.
- **December 2, 2000**—Two men were glissading (sitting) when the snow fractured and swept them down for a short and bumpy ride. The pair were lucky the snow did not sweep them into the large rocks near the toe of the debris. Both men remained on the surface and were able to walk away.
- **April 21, 2000**—Two out-of-area skiers were caught in an avalanche at Arapahoe Basin. One died from his injuries a few days later.
- **January 25, 2000**—An out-of-area snowboarder was buried and killed at Arapahoe Basin.
- **December 21, 1999**—A lone backcountry skier was buried and killed on the south side of Quandary Peak.
- **March 15, 1987**—Two brothers died in an avalanche while snowmobiling in the Shrine Pass area.
- **February 18, 1987**—The Peak 7 avalanche near the Breckenridge Ski Area ripped across the entire face of the peak and left debris piled up to 20 feet deep across 23 acres. Despite the warnings, eight backcountry skiers were caught in the slide, which resulted in one of the largest search and rescue missions ever in Colorado. Four of the skiers were killed.

Figure 3-3 Avalanche Path on Colorado Highway 91 Near Copper Mountain

March 2019. Source: Picture taken by Colorado State Patrol. Summit Daily https://www.summitdaily.com/news/multiple-cars-trapped-under-15-feet-of-snow-after-massive-avalanche-near-copper-mountain/

There were several other notable events discussed by online databases such as the CAIC and NOAA's NCEI as well as the HMPC that did not involve deaths or injuries. An avalanche slid onto the parking lot at Arapahoe Basin ski area (year unknown). In 2003, an avalanche near Silver Plume (Clear Creek County) took out a power transmission line and cellular phone tower causing the Loveland Ski Area to close for the day. An avalanche on Buffalo Mountain just above the Wildernest Subdivision in February 1987 cleared swaths of forest; the scars remain visible to this day.

Probability of Future Occurrence

Highly Likely—Near 100% chance of occurrence next year or happens every year

Between 1987 and 2019, there were 26 notable avalanches in Summit County (e.g., avalanches that involved injuries or deaths to people, property damages, infrastructure interruptions, or road closures). This suggests that at least one notable avalanche occurs nearly every year in Summit County.

Magnitude/Severity

Critical—Isolated deaths and/or injuries and illnesses likely based on historical events, along with often major or long-term property damage that threatens structural stability and/or interruption of essential facilities and services for 24-72 hours. Avalanches in Summit County can injure and kill multiple people, damage property and infrastructure, and cause road closures or even infrastructure/utility/service interruptions. The overall significance rating for this hazard is **High**.

Climate Change Considerations

Climate change is likely to alter the frequency and severity of avalanches in the future. In the last decade many experts in western states have pointed out increased avalanche risk associated with a changing snow, precipitation, accumulation, and overall warmer winter patterns. Snow may fall early in the winter and is then followed by a long period without snow. This creates a thin snowpack that becomes structurally weaker as winter goes on. New layers of snow may not bond well to the weak base layer, creating prime conditions for avalanches. Periods of sporadic snowfall in early and mid-spring in Colorado also contribute to this process of creating structurally weaker snowpack, which can lead to avalanche activity as snow accumulation has already begun to thaw with the warmer season. As Colorado experiences winters with higher average temperatures and lower average precipitation, these conditions that increase avalanche risk become more common. More intense and continuous storms over multiple days can also increase the potential for major avalanche cycles, as was experienced in March 2019.

3.2.2 Dam Incidents

Hazard Description

Dams are constructed for a variety of uses, including flood protection, power, agriculture/irrigation, water supply, and recreation. Dams typically are constructed of earth, rock, concrete, or mine tailings. Two factors that influence the potential severity of a full or partial dam failure are the amount of water impounded and the density, type, and value of development and infrastructure located downstream.

Dam failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which result in overtopping (overtopping is the primary cause of earthen dam failure)
- Earthquake/seismic activity

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

Geographic Location

The geographic extent of this hazard in Summit County is **Small**—10-25% of the planning area affected.

The U.S. Army Corps of Engineers National Inventory of Dams (NID) database was queried alongside supplied dam information from the Summit County HMPC. Between both sources 14 dams in the County are listed and classified based on the potential hazard to the downstream areas as a result of failure or mis-operation of the dam or facilities:

- **High Hazard Potential**—Probable loss of life
- **Significant Hazard Potential**—No probable loss of human life but can cause economic loss, environment damage, disruption of lifeline facilities, or other major impacts; often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure
- **Low Hazard Potential**—No probable loss of human life and low economic and/or environmental losses; losses are principally limited to the owner's property

Based on these classifications, there are 8 high hazard dams, 4 significant hazard dams, and 2 low hazard dam in Summit County. These dams are listed in Table 3-4 and illustrated in Figure 3-4. The high and significant hazard dams all have emergency action plans (EAP) in place, while the low hazard dams are not required to have these EAPs.

Table 3-4 Dams in Summit County

Dam Name	River	Downstream City	Dam Type	Max Storage (Acre-Feet)	EAP	Dam Info Source	Hazard Class	Primary Use
Bills Ranch Lake	Miners-Tr	Frisco	Earth	7	Y	NID 2018	Significant	Fish and Wildlife Pond
Buffehrs	Tenmile Creek	Frisco	Earth	152	NR	NID 2018	Low	Water Supply
Clinton Gulch	Tenmile Creek	Frisco	Earth	4,372	Y	County	High	Recreation
Dillon	Blue River	Silverthorne	Earth	257,304	Y	County	High	Water Supply
Goose Pasture Tarn	Blue River	Breckenridge	Earth	812	Y	County	High	Recreation
Green Mountain	Blue River	Kremmling	Earth	154,645	Y	County	High	Compensatory Storage
Hoagland #1	Elliott Creek	Kremmling	Earth	476	NR	County	Low	Irrigation
Mayflower Pond #5		Frisco	Earth	64,300	Y	NID 2018	High	Tailings
Reynolds	Soda Creek	Dillon	Earth	157	Y	County	Significant	Irrigation

Dam Name	River	Downstream City	Dam Type	Max Storage (Acre-Feet)	EAP	Dam Info Source	Hazard Class	Primary Use
Robinson Tailing Pond #1 Dam		Red Cliff	Earth	73,391	Y	NID 2018	High	Other
Sawmill	Sawmill Gulch	Breckenridge	Earth	27	Y	County	Significant	Recreation
Ten Pond #3 Dam		Frisco	Earth	152,703	Y	NID 2018	High	Tailings
Upper Black Creek Res	Black Creek	Kremmling	Earth	428	Y	NID 2018	Significant	Recreation
Upper Blue Lake	Monte Cristo Creek	Breckenridge	Earth	2,100	Y	County	High	Water Supply

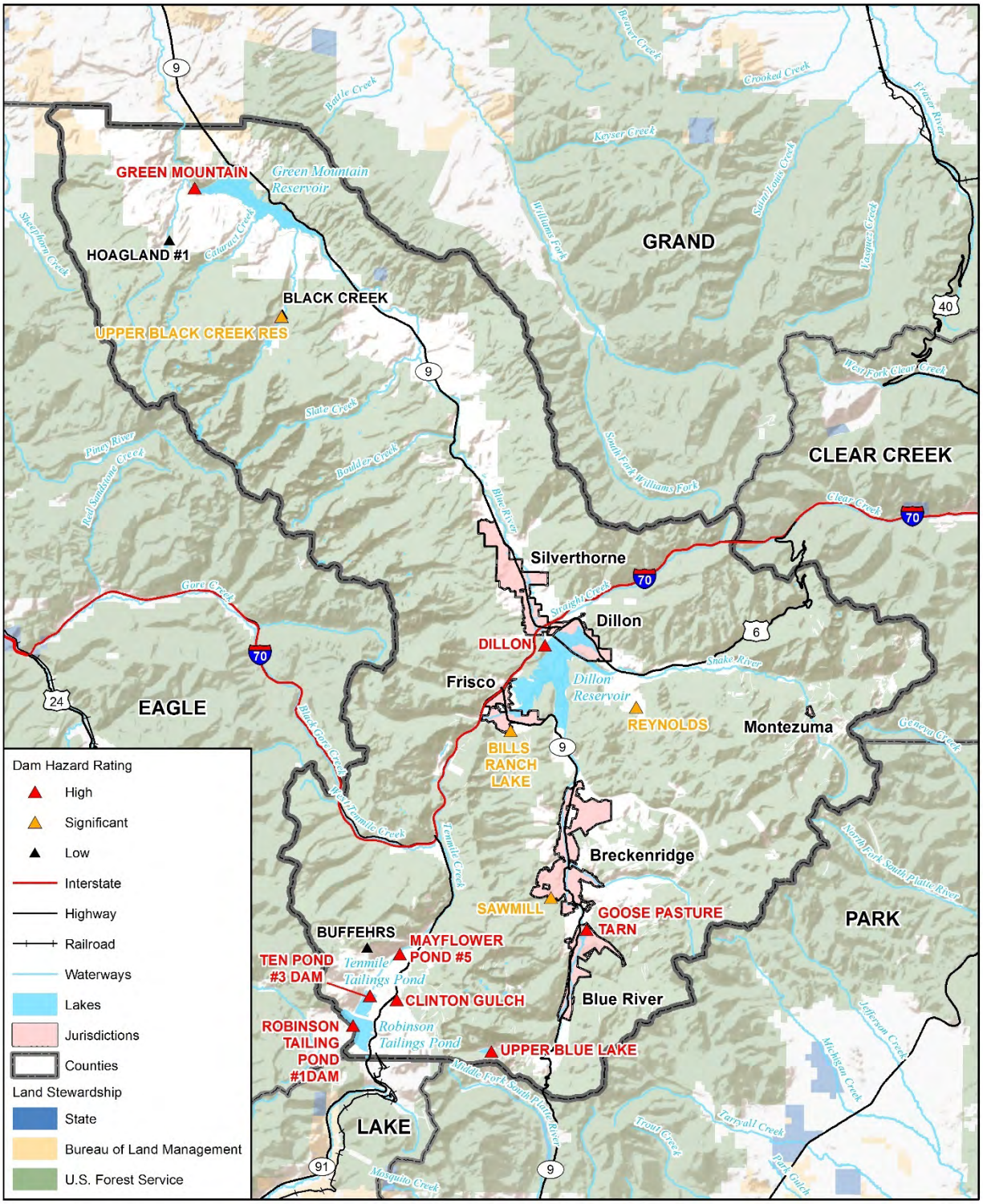
Source: Summit County; National Inventory of Dams 2018; Water Commissioner Division 5 – District 36

Breckenridge could be impacted by a failure of the Goose Pasture Tarn Dam, Upper Blue Lake Dam, and the Sawmill Dam, all of which are high or significant in terms of hazard rating. Frisco is exposed to four high or significant hazard dams that may potentially inundate: the Clinton Gulch Dam, the Mayflower Pond #5 Dam, Ten Pond #3 Dam, and Bills Ranch Lake Dam. The Summit Cove neighborhood including the Summit Cove Elementary School, Swan Mountain Road and the Wastewater Treatment Plant could be at risk of the Reynolds Dam (significant in terms of hazard rating). Finally, Silverthorne could be affected by failure of the Dillon Dam. This dam has several purposes including recreational water use/supply and hydroelectric generation and is managed by local government and public utility entities (the City/County of Denver and the Denver Board of Water Commissioners). Other uses of the reservoir dammed by the Dillon Dam structures include water storage collected from snowmelt runoff, for domestic use on the eastern slope/Denver area. There is less risk to the jurisdictions of Montezuma and Blue River, based on their location and elevation. Unincorporated areas of the county may also be at risk of various dams, however.

There are also three tailings related dam structures in the southwestern corner of Summit County, associated with molybdenum processing at the Climax Molybdenum mine. The Robinson Tailing Pond #1 Dam is rated as a high significance structure, though it does currently have an EAP on file, and is used for mine tailings storage. The Mayflower Pond #5 and the Ten Pond #3 Dam structures are tailings storage facilities are also rated as high hazard dams. As such, failure of these tailings impoundment structures could lead to a debris flow with contaminated materials towards the Town of Frisco and other portions of the unincorporated county.

Additional information on the potential risk to life, property, infrastructure, and other assets and county resources are contained in discussions, tables, and maps under the Vulnerability Assessment section for this hazard (Section 3.3.3).

Figure 3-4 Summit County Dams



Previous Occurrences

In July 2011, the Bills Ranch Dam was overtopped. This dam is non-jurisdictional in size, but total failure would cause significant property damage downstream. A combination of heavy snowmelt, heavy rain, and the failure of a beaver dam upstream (named Rainbow Lake Dam) overwhelmed the small spillway and outlet, causing the dam to be overtopped. The dam overtopped twice in the evening of July 3rd and then again in the evening of July 5th. An inspection of the dam on July 7th also revealed that heavy rodent activity had caused the crest of the dam to settle, making it more prone to overtopping. The dam safety engineer made several recommendations for improving the structural integrity of the dam and reducing the risk of overtopping and seepage. Those improvements were completed during the fall of 2012 and approved by the dam safety engineer.

No additional information was available on past dam failure events in Summit County.

Probability of Future Occurrence

Unlikely—Less than 1% chance of occurrence in next 100 years

Using the methodology adopted for natural hazards in this plan, only one past event represents an unlikely probability of future occurrence. However, because dam failure is a human-caused hazard, the methodology for calculating probability based on past occurrences does not necessarily reflect the actual risk of future occurrence. Further information on dam failure related risk is presented in the Vulnerability Assessment section (3.3).

Magnitude/Severity

Catastrophic—Failure of a significant or high hazard dam could lead to multiple deaths; property destroyed and severely damaged; and/or interruption of essential facilities and services for more than 72 hours.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property located in the inundation area (downstream). The largest three dams in terms of maximum storage are the Dillon, the Green Mountain, and the Ten Pond #3 Dams (with 257,304 acre-feet, 154,645 acre-feet, and 152,703 acre-feet of capacity, respectively).

A failure of the Dillon Dam would be catastrophic to the Town of Silverthorne but would also affect Dillon and Frisco. Unincorporated areas of the County located downstream from the dam and all the way to the Grand County border would also be flooded, along the Blue River. The Bureau of Reclamation regularly monitors and maintains Green Mountain Dam, and the dam continues to perform well. Failure of this dam would have greater impacts in Grand County and Kremmling. The Ten Pond #3 Dam would affect Frisco the worst, as well as those unincorporated areas between the dam and the Town (along the Tenmile Creek). Failure of the Robinson Tailing Pond #1 tailings dam in the southwestern corner of the County could release a devastating toxic sludge debris flow. This structure is the fourth largest in terms of maximum storage, with 73,391 acre-feet of tailings materials.

Rehabilitation of Goose Pasture Tarn Dam, located on the Blue River and in the Town of Blue river approximately two miles south of the Town of Breckenridge, is planned to start in May 2020 and be completed by the fall of 2022. The Colorado State Engineers Office (SEO) and Engineers working for the Town of Breckenridge have identified dam safety concerns, and the dam is currently under a lower reservoir restriction level imposed by the SEO until rehabilitation measures to improve dam safety have

been implemented. The measures generally include replacement of two existing spillways with a single spillway, construction of a downstream drainage system, and lining of the outlet works conduit among other measures. The Town of Breckenridge is working with FEMA to obtain a FEMA grant to help fund the project, in addition to obtaining low-interest rate from CWCB.

The HMPC noted that Summit County tried to obtain funding for Black Creek Dam repairs but was denied due to the FEMA cost benefit analysis not producing a qualifying outcome.

The overall significance rating for this hazard is **Medium.**

Climate Change Considerations

The specific ways in which a changing climate may result in an increase of dam failure events, intensity, or even location of these failures requires additional research. However, with a potential for more extreme precipitation events associated with climate change, there are possible impacts including large inflows to reservoirs, which may then cause overtopping and hence a dam to fail and inundate areas downstream. Nevertheless, this potential outcome could be offset by generally lower reservoir levels if storage/water resources become more limited or stretched in the future due to climate change effects including drought or reduced precipitation levels combined with population growth.

3.2.3 Drought

Hazard Description

Drought is a condition of climatic dryness that reduces available soil moisture and water supplies needed for sustaining plant, animal, and human life systems. Lack of adequate annual precipitation, which is primarily snowfall in Summit County, can result in drought conditions. Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Due to Colorado's semiarid conditions, drought is a natural but unpredictable occurrence in the state. Single season droughts over some portion of the state are quite common. The onset of drought in western Colorado mountain counties is usually signaled by a lack of significant winter snowfall. Hot and dry conditions that persist from spring into summer and fall can aggravate drought conditions, making the effects of drought more pronounced as water demands increase during the growing season and summer months.

Drought is a complex issue involving many factors—it occurs when a normal amount of moisture is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological drought** is usually defined by a period of below average water supply. The commonly used definition of meteorological drought is an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place consistently falls below the climatically appropriate moisture supply.
- **Agricultural drought** occurs when there is an inadequate water supply to meet the needs of crops and other agricultural operations such as livestock. Agricultural drought usually occurs after or during

meteorological drought, but before hydrological drought and can affect livestock and other dry-land agricultural operations.

- **Hydrological drought** is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels. There is usually a delay between lack of rain or snow and less measurable water in streams, lakes, and reservoirs. Therefore, hydrological measurements tend to lag behind other drought indicators.
- **Socioeconomic drought** occurs when a drought impacts health, well-being, and quality of life or when a drought starts to have an adverse economic impact on a region.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in Colorado are those related to water intensive activities such as agriculture, wildland fire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. An ongoing drought may leave an area more prone to beetle kill and associated wildland fires. Drought conditions can also cause soil to compact, increasing an area's susceptibility to flooding, and reduce vegetation cover, which exposes soil to wind and erosion. A reduction of electric power generation and water quality deterioration are also potential problems. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. Drought affects the water supply of communities and water districts in the County, as well as the ski and recreation industries that drive the County's economy.

The onset of drought in Colorado mountainous counties is usually signaled by a lack of significant winter snowfall. Hot and dry conditions that persist into spring, summer, and fall can aggravate drought conditions, making the effects of drought more pronounced as water demands increase during the growing season and summer months. Drought in Summit County can have widespread impacts on the availability of water supplies for Front Range Communities.

Geographic Location

The geographic extent of this hazard in Summit County is **large**—more than 50% of the planning area affected. Drought is a regional hazard, and at its worst can affect the entire state of Colorado with varying levels of dryness.

The Western Regional Climate Center reports precipitation data from weather stations in and around Summit County. The data reported here are from three of the stations: Breckenridge, Dillon, and Green Mountain Dam. Precipitation is greatest in Breckenridge, where the month with the most average precipitation is July. Precipitation is least at the Green Mountain reservoir, where May is the month with the most average precipitation. Table 3-5 contains precipitation summaries for the three stations, and Figure 3-5 through Figure 3-7 show monthly average total precipitation. These summaries include rainfall only. Drought in Colorado and Summit County is largely contingent upon winter snowpack. Snowfall summaries can be found in *Section 3.2.11 Severe Winter Weather*.

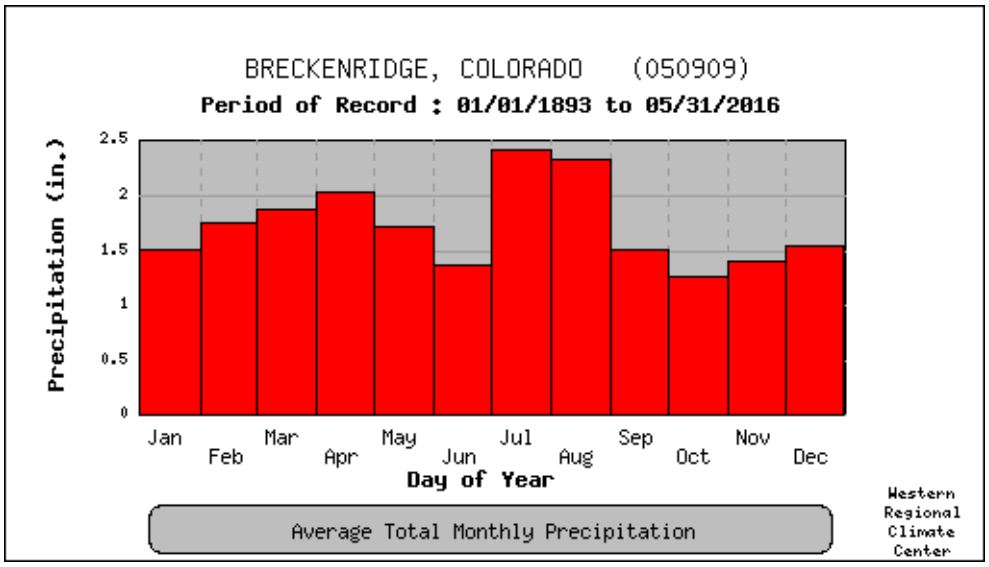
Table 3-5 Summit County Precipitation Summaries[1]

Station	Average Annual Precipitation	Month with Most Precipitation/Average Precipitation	Highest Monthly Precipitation	Highest Annual Precipitation
Breckenridge[2]	20.26	July/2.39	8.51/Dec. 1893	29.96/1995
Dillon[2]	16.01	July/1.92	6.97/Feb. 1936	26.28/1936
Green Mountain Dam[3]	15.03	May/1.62	5.95/Sept. 1961	22.37/1945

Source: Western Regional Climate Center, www.wrcc.dri.edu/.

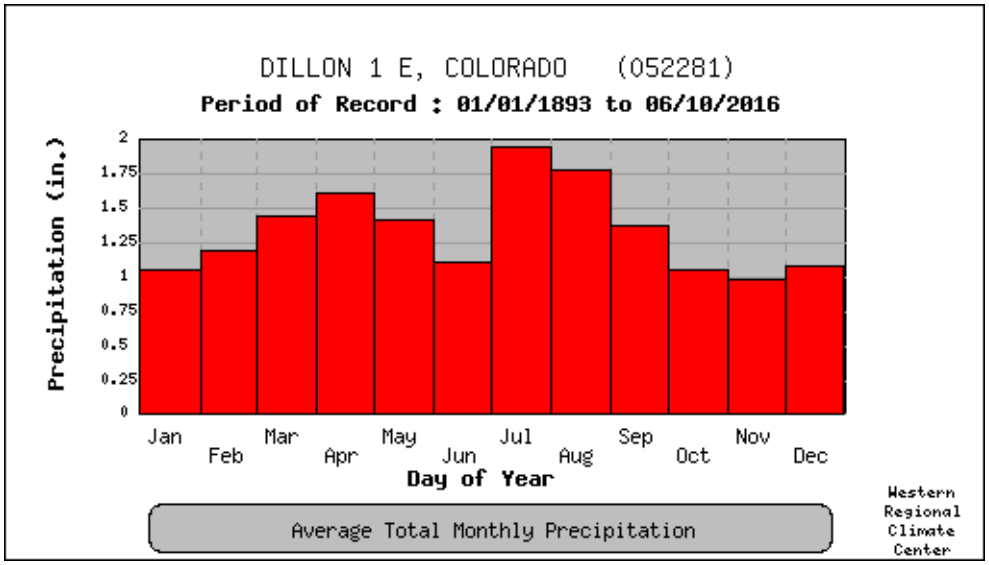
[1]All totals are reported in inches; [2]Period of Record: 1893-2016; [3]Period of Record: 1939-2016

Figure 3-5 Breckenridge Station Monthly Average Total Precipitation



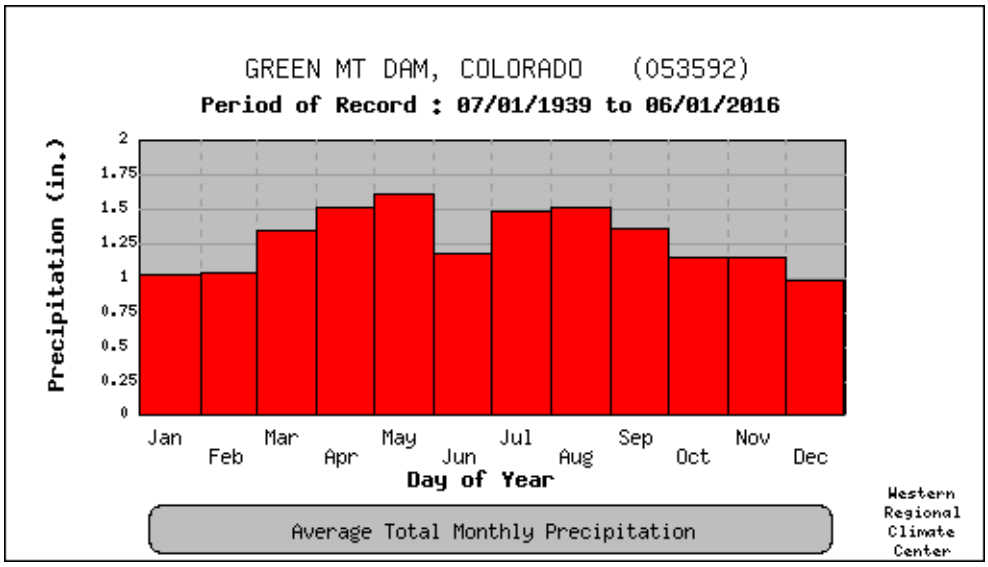
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3-6 Dillon Station Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3-7 Green Mountain Dam Station Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Previous Occurrences

Colorado has experienced multiple severe droughts, in 2018, 2011-2013, 2004-2000, 1996, 1994, 1990, 1989, 1979-1975, 1965-1963, 1957-1951, 1941-1931, and 1905-1893 (Colorado Water Conservation Board, 2018). The most significant of the instrumented period (which began in the late 1800s) are listed in Table 3-6. Although drought conditions can vary across the state, it is likely that Summit County suffered during these dry periods.

Table 3-6 Historical Dry and Wet Periods in Colorado

Date	Dry	Wet	Duration (years)
1893-1905	X		12
1905-1931		X	26
1931-1941	X		10
1941-1951		X	10
1951-1957	X		6
1957-1959		X	2
1963-1965	X		2
1965-1975		X	10
1975-1978	X		3
1979-1999*		X	20
2000-2006*	X		6
2007-2010		X	3
2011-2013	X		2
2018	X		1

Source: McKee, et al. *Modified for the Colorado State Drought Plan in 2010 and Summit County Mitigation Plan 2019 based on input from the Colorado Climate Center and US Drought Monitor.

The following droughts were significant to Summit County:

- **2018:** Summit County experienced drought conditions that began in January, with extreme drought (D3) from August through October, with severe drought conditions continuing through February of 2019; substantial March and April precipitation brought conditions back to normal for the remainder of 2019.
- **2012-2013:** Summit County was included as a contiguous county in USDA drought declaration S3456. Summit was listed as a primary county for USDA drought declaration S3260.
- **2011-2012:** Colorado's ski industry suffered economic losses due to the low snowpack and drought conditions in 2011 and 2012. Colorado Ski County USA (CSCUSA) reported a decrease of 11.4 % in skier visits during the 2011-12 season as compared to the previous ski season. Climate data indicates that precipitation on Colorado's Western Slope for the 2011-12 winter was 43% below average, with the second warmest March on record. Statewide, the snowpack was 54% of average in April 2012. Skier visits continued to decrease between opening day of the 2012-13 ski season and December 31, 2012.
- **2006**: The U.S. Agriculture Secretary designated Summit among 59 counties in Colorado as disaster area due to the ongoing drought, high winds, insect pests, and a late freeze (Summit received its designation as a contiguous county).
- **2002**: This year was the driest year on record for the Denver region and much of the state. For the first time in state history, the Colorado governor asked the federal government to declare all of Colorado a drought disaster area. With an average temperature of 52 degrees, 2001 was the warmest year since 1986. The drought started in late 1999 and was compounded by scarce snowfall in 2001. Total precipitation for 2002 was 7.48 inches; the average is 15.81 inches (National Weather Service, Denver Office). April, normally the third snowiest month of the year with just over 9 inches, ended up being the third driest April on record for Denver. Only a trace of snow was recorded for the month with .23 inches liquid precipitation. The snowpack in the North Platte River Basin was only 44 percent

of normal by the end of the month. In Summit County, the drought depleted reservoirs and the resulting exposed soils along the shorelines caused problems with dust and air pollution.

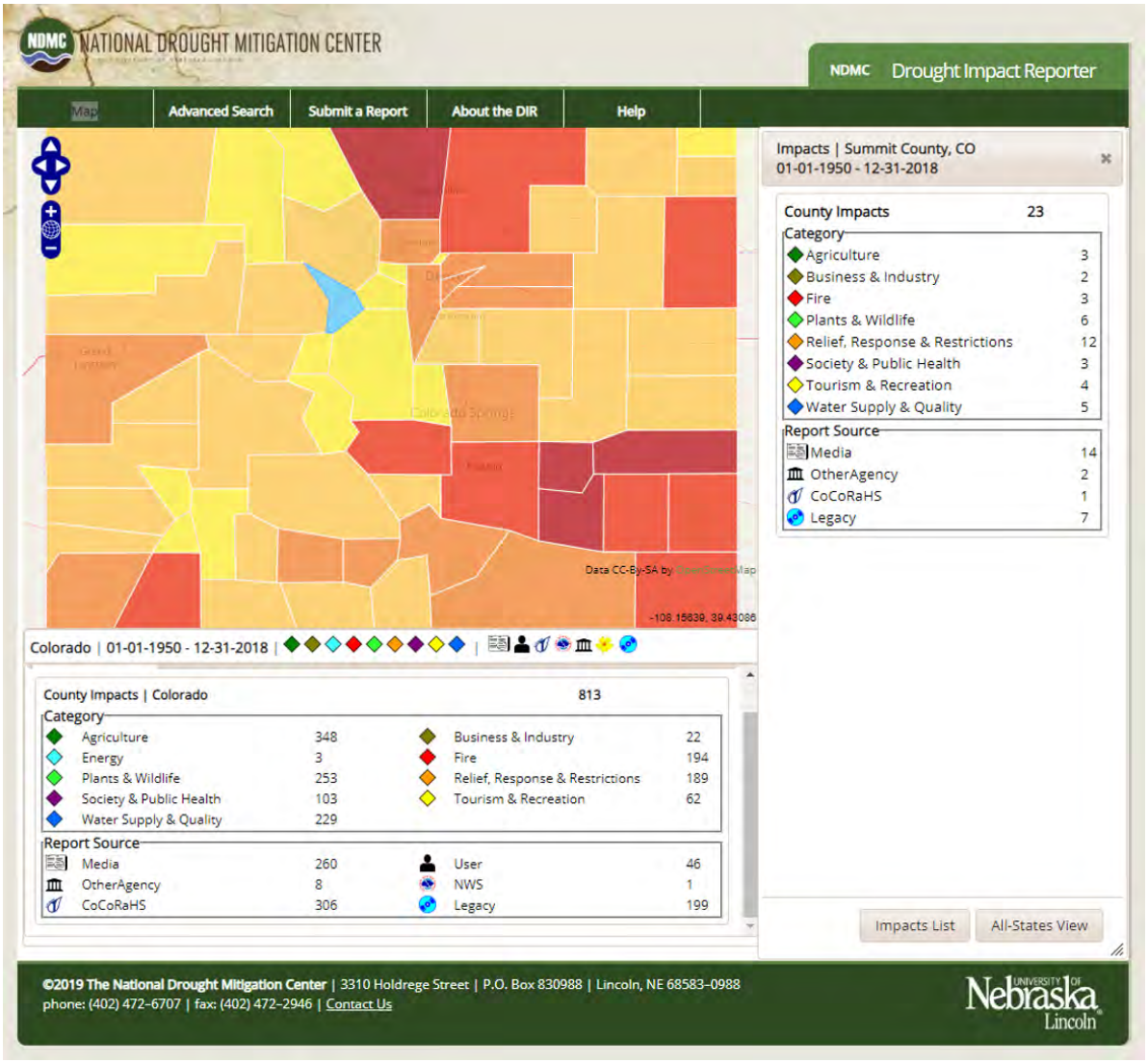
- **2000**: Strong La Niña conditions created below average precipitation and above average temperatures for most months in 2000. Statewide, snowpack started out well below average but recovered to near average in March. However, an early snowmelt resulted in low stream flows, and by June, drought conditions began to affect most of the state. By fall, weather patterns returned to near normal with average precipitation and below average temperatures.
- **1989**: In March 1989, the State Drought Water Availability Task Force met to access drought conditions within Colorado. Warm dry conditions during April of 1989 reduced snowpack to 50% of average.
- **1980–1981**: This drought, beginning in the fall of 1980 and lasting until the summer of 1981, had costly impacts to the ski industry.
- **1976–1977**: This drought was characterized as a winter event, limited in duration. It was the driest winter in recorded history for much of Colorado's high country and western slope, severely impacting the ski industry. Colorado agriculture producers and municipalities received over $110 million in federal drought disaster aid.

There has been one Federal disaster declaration related to drought for Summit County, EM-77026 declared January 29, 1977. Since 1977 there have been 7 drought declarations issued by the USDA's Secretary of Agriculture in Summit County, 5 of which were Fast Track Secretarial disaster designations (see Table 3-3 in Section 3.1.1). According to the Secretary of Agriculture, a Fast Track designation is for a severe drought and provides an automatic designation when, during the growing season, any portion of the county meets the severe drought intensity value for eight consecutive weeks or more.

The National Drought Mitigation Center developed the Drought Impact Reporter in response to the need for a national drought impact database for the United States. Information comes from a variety of sources: online drought-related news stories and scientific publications, members of the public who visit the website and submit a drought-related impact for their region, members of the media, and members of relevant government agencies. The database is being populated beginning with the most recent impacts and working backward in time.

The Drought Impact Reporter contains information on 813 drought impacts from droughts that affected Colorado between 2012 and 2018, 23 of which impacted Summit County. The list is not comprehensive, but only captures reported impacts. These impacts are shown in Figure 3-8, and described in the text below, along with the number of impacts for that category reported in Summit County during that time period.

Figure 3-8 Drought Impact Reporter Summary of Impacts in Summit County, 1950 – 2018



- **Agriculture (3)** – Drought effects associated with agriculture, farming, aquaculture, horticulture, forestry, or ranching. Examples of drought-induced agricultural impacts include damage to crop quality; income loss for farmers due to reduced crop yields; reduced productivity of cropland; insect infestation; plant disease; increased irrigation costs; cost of new or supplemental water resource development (wells, dams, pipelines) for agriculture; reduced productivity of rangeland; forced reduction of foundation stock; closure/limitation of public lands to grazing; high cost or unavailability of water for livestock, Christmas tree farms, forestry, raising domesticated horses, bees, fish, shellfish or horticulture.
- **Business & Industry (2)** – This category tracks drought's effects on non-agriculture and non-tourism businesses, such as lawn care, recreational vehicles or gear dealers, and plant nurseries. Typical impacts include reduction or loss of demand for goods or services, reduction in employment, variation in number of calls for service, late opening or early closure for the season, bankruptcy, permanent store closure, and other economic impacts.

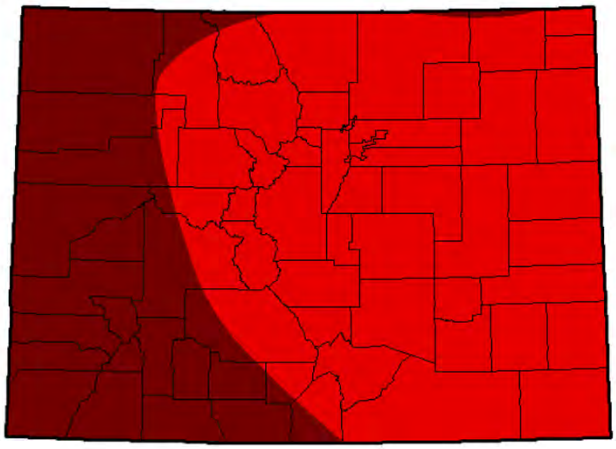
- **Energy (0)** – This category concerns drought's effects on power production, rates, and revenue. Examples include production changes for both hydropower and non-hydropower providers, changes in electricity rates, revenue shortfalls and/or windfall profits, and purchase of electricity when hydropower generation is down.
- **Fire (3)** – Drought often contributes to forest, range, rural, or urban fires, fire danger, and burning restrictions. Specific impacts include enacting or easing burning restrictions, fireworks bans, increased fire risk, occurrence of fire (number of acres burned, number of wildland fires compared to average, people displaced, etc.), state of emergency during periods of high fire danger, closure of roads or land due to fire occurrence or risk, and expenses to state and county governments of paying firefighters overtime and paying equipment (helicopter) costs.
- **Plants & Wildlife (6)** – Drought effects associated with unmanaged plants and wildlife, both aquatic and terrestrial, include loss of biodiversity of plants or wildlife; loss of trees from rural or urban landscapes, shelterbelts, or wooded conservation areas; reduction and degradation of fish and wildlife habitat; lack of feed and drinking water; greater mortality due to increased contact with agricultural producers, as animals seek food from farms and producers are less tolerant of the intrusion; disease; increased vulnerability to predation (from species concentrated near water); migration and concentration (loss of wildlife in some areas and too much wildlife in others); increased stress on endangered species; salinity levels affecting wildlife; wildlife encroaching into urban areas; and loss of wetlands.
- **Relief, Response & Restrictions (12)** – This category refers to drought effects associated with disaster declarations, aid programs, requests for disaster declaration or aid, water restrictions, or fire restrictions. Examples include disaster declarations, aid programs, USDA Secretarial disaster declarations, Small Business Administration disaster declarations, government relief and response programs, state-level water shortage or water emergency declarations, county-level declarations, a declared "state of emergency," requests for declarations or aid, non-profit organization-based relief, water restrictions, fire restrictions, NWS Red Flag warnings, and declaration of drought watches or warnings.
- **Society & Public Health (3)** – Drought effects associated with human, public and social health include health-related problems related to reduced water quantity and/or quality, such as increased concentration of contaminants; loss of human life (e.g. from heat stress, suicide); increased respiratory ailments; increased disease caused by wildland fire concentrations; increased human disease caused by changes in insect carrier populations; population migration (rural to urban areas, migrants into the United States); loss of aesthetic values; change in daily activities (non-recreational, like putting a bucket in the shower to catch water); elevated stress levels; meetings to discuss drought; communities creating drought plans; lawmakers altering penalties for violation of water restrictions; demand for higher water rates; cultural/historical discoveries form low water levels; prayer meetings; cancellations of fundraising events; cancellation/alteration of festivals or holiday traditions; stockpiling water; public service announcements and drought information websites; protests; and conflicts within the community due to competition for water.
- **Tourism & Recreation (4)** – Drought effects associated with recreational activities and tourism include closure of state hiking trails and hunting areas due to fire danger; water access or navigation problems for recreation; bans on recreational activities; reduced license, permit, or ticket sales (e.g. hunting, fishing, ski lifts, etc.); losses related to curtailed activities (e.g. bird watching, hunting and fishing, boating, etc.); reduced park visitation; and cancellation or postponement of sporting events.
- **Water Supply & Quality (5)** – Drought effects associated with water supply and water quality include dry wells, voluntary and mandatory water restrictions, changes in water rates, easing of water restrictions, increases in requests for new well permits, changes in water use due to water restrictions, greater water demand, decreases in water allocation or allotments, installation or alteration of water

pumps or water intakes, changes to allowable water contaminants, water line damage or repairs due to drought stress, drinking water turbidity, change in water color or odor, declaration of drought watches or warnings, and mitigation activities.

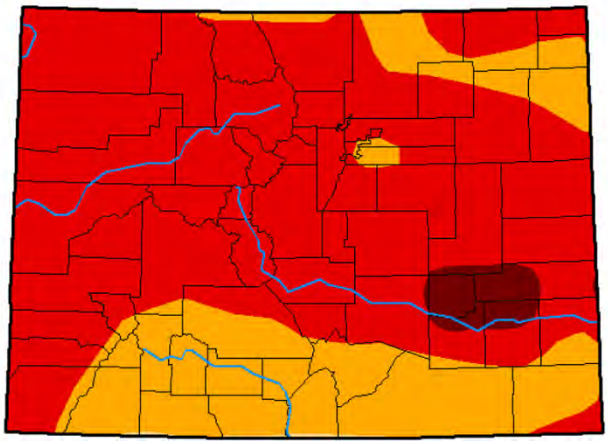
- **General Awareness (0)** – General Awareness applies only to media reports and usually indicates that people are concerned about drought, but no specific impact has occurred yet or the information is too general to use for an impact.
- **Other (0)** – Drought impacts that do not easily fit into any of the above categories.

Figure 3-9 compares the severity of different droughts in Colorado, from July 2002, July 2012, March 2013, and August 2018. The maps illustrate returning drought conditions in Colorado as a whole. The 2012 drought contributed to a severe fire season in Colorado that resulted in a Presidential Disaster Declaration for the Waldo Canyon and High Park wildfires.

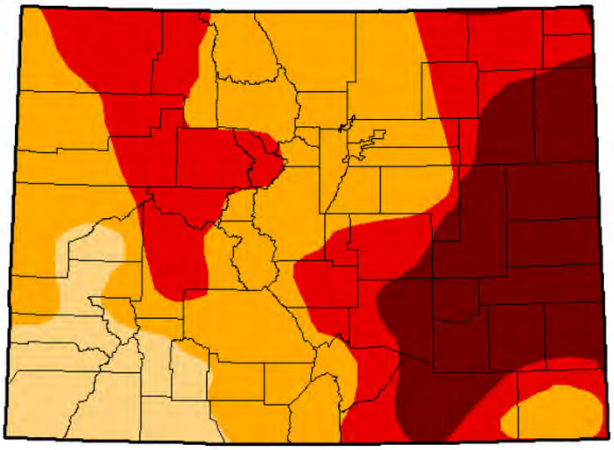
Figure 3-9 U.S. Drought Monitor for Colorado



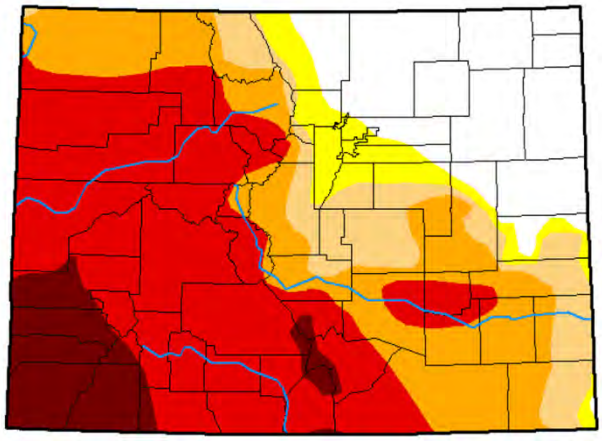
July 23, 2002



July 24, 2012



March 19, 2013



August 14, 2018

State drought conditions (percent area)

Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
07/23/2002	0.00	100.00	100.00	100.00	100.00	33.61
07/24/2012	0.00	100.00	100.00	99.70	73.67	2.82
03/19/13	0.00	100.00	100.00	88.97	48.06	21.22
8/14/18	18.63	81.37	75.86	65.91	45.46	8.5

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Source: National Drought Mitigation Center, www.drought.unl.edu/

Probability of Future Occurrence

Likely—10-100% chance of occurrence in next year or has a recurrence interval of 10 years or less.

According to information from the Colorado Drought Mitigation and Response Plan, including recent drought conditions, Colorado was in drought for 50 of the past 126 years (1893-2018). Thus, there is a 39.7% chance that a drought will happen in Colorado in any given year, and a drought can be expected somewhere in the state every 2.5 years. Summit County has had significant impacts in six droughts in the last 40 years.

A drought vulnerability study prepared by the CWCB in 2010 and updated in 2018 looked at the potential for climate change to alter drought recurrence, length, and intensity. This study builds upon information obtained in Phase I of the CWCB's Colorado Water Availability Study. Based on these studies the average length of the observed drought in the Colorado River basin, which includes Summit County, is six years. The chance of experiencing a drought longer than the historical observed length is only slightly greater than 50%. The study indicates other basins in Colorado, notably the San Juan Basin in the southwest, has a higher chance of exceeding the drought longer than the observed record (75-88%). While there is a large amount of uncertainty regarding future climate scenarios and how these may translate to physical conditions, the study indicates that current climate is not stationary and that planning efforts should take into account this uncertainty.

Magnitude/Severity

Limited—Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours

Drought impacts in Summit County can be wide-reaching: economic, environmental, and societal. The most significant impacts associated with drought are those related to water intensive activities such as wildfire protection, commerce, tourism, recreation, municipal usage, and wildlife preservation. Drought during the winter season impacts the ski industry and economy of Summit County. Drought in the summer increases problems with dust and erosion and can cause deterioration in water quality. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It also increases the wildfire hazard and even landslide hazard. In 1963 a rapid drawdown of the water in Green Mountain Reservoir caused a landslide that resulted in the loss of several homes in the community of Heeney. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

Climate Change Considerations

The Intergovernmental Panel on Climate has projected dramatic changes in regional climate characteristics between present-day and if global temperatures rise between 1.5 degrees Celsius and 2 degrees Celsius. Climate change can have impacts both in terms of inter-annual droughts and intra-annual runoff patterns (State of Colorado Drought Mitigation and Response Plan Update, 2018). Temperatures increased and resulting changes in evaporation and soil moistures will also add to the trend of decreasing runoff in a majority of Colorado Basins. The following table shows the challenges water managers may face with the projected changes in climate.

Table 3-7 Future Drought Vulnerability Due to Climate Change and Challenges Faced by Colorado Water Managers

Challenge	Observed and/or Projected Change
Water demands for agriculture and outdoor watering	Increasing temperatures raise evapotranspiration by plants, lower soil moisture, alter growing seasons, and thus increase water demand.
Water supply infrastructure	Changes in snowpack, streamflow timing, and hydrograph evolution may affect reservoir operations including flood control and storage. Changes in the timing and magnitude of runoff may affect functioning of diversion, storage, and conveyance structures.
Legal water systems	Earlier runoff may complicate prior appropriation systems and interstate water compacts, affecting which rights holders receive water and operations plans for reservoirs
Water quality	Although other factors have a large impact, "water quality is sensitive both to increased water temperatures and changes in patterns of precipitation" (CCSP SAP 4.3, p. 149). For example, changes in the timing and hydrograph may affect sediment load and pollution, impacting human health.
Energy demand and operating costs	Warmer air temperatures may place higher demands on hydropower reservoirs for peaking power. Warmer lake and stream temperatures may affect water use by cooling power plants and other industries.
Mountain habitats	Increasing temperature and soil moisture changes may shift mountain habitats toward higher elevation.
Interplay among forests, hydrology, wildfires, and pests	Changes in air, water, and soil temperatures may affect the relationships between forests, surface and groundwater, wildfire, and insect pests. Water-stressed trees, for example, may be more vulnerable to pests.
Riparian habitats and fisheries	Stream temperatures are expected to increase as the climate warms, which could have direct and indirect effects on aquatic ecosystems (CCSP SAP 43.), including the spread of instream non-native species and diseases to higher elevation and the potential for nonnative plant species to invade riparian areas. Changes in streamflow intensity and timing may also affect riparian ecosystems.
Water – and snow – based recreation	Changes in reservoir storage affect lake and river recreation activities; changes in streamflow intensity and timing will continue to affect rafting directly and trout fishing indirectly. Changes in the character and timing of snowpack and the ratio of snowfall to rainfall will continue to influence winter recreational activities and tourism.
Groundwater resources	Changes in long-term precipitation and soil moisture can affect groundwater recharge rates; coupled with demand issues, this may mean greater pressure on groundwater resources.

Source: State of Colorado Drought Mitigation and Response Plan 2018, Reproduced from CWCB

3.2.4 Earthquake

Hazard Description

Earthquakes are the vibrations or shaking caused by a sudden break or slip on a fault. Stresses in the earth's outer layer force the large plates of Earth's crust (faults) move with respect to one another. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust, then leading to the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a Richter magnitude and is measured directly from the earthquake as recorded on seismographs. Another measure of earthquake severity is intensity. The severity of an

earthquake, or the amount of energy released during an earthquake, is usually expressed in terms of intensity or magnitude as described further in the Magnitude/Severity section below. Table 3-9 features abbreviated descriptions of the various levels of intensity, magnitude, frequency, and the likely effects on people and property.

Earthquakes can cause structural and non-structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, communication, and transportation lines. Damage and life loss can be particularly devastating in communities where buildings were not designed to withstand seismic forces (e.g., historic structures). Other damage-causing effects of earthquakes include surface rupture, fissuring, settlement, and permanent horizontal and vertical shifting of the ground. Secondary impacts can include landslides, seiches (damaging waves within reservoirs, lakes, and other water bodies), liquefaction, fires, and dam failure. 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.

By studying the geologic characteristics of faults, geoscientists can often determine when the fault last moved and estimate the magnitude of the earthquake that produced the last movement. Because the occurrence of earthquakes is relatively infrequent in Colorado and the historical earthquake record is short, accurate estimations of magnitude, timing, or location of future dangerous earthquakes in Summit County and statewide are difficult to estimate.

Geographic Location

The geographic extent of this hazard in Summit County is **Large**—more than 50% of the planning area affected. All of Summit County is at risk to a potential earthquake.

According to the Colorado Geological Survey (CGS) and the U.S. Geological Survey (USGS), Colorado has areas with low to moderate potential for damaging earthquakes. The presence of potentially active faults is an indicator of potential earthquake risk. There are about 90 potentially active faults that have been identified in Colorado, with documented movement within the last 1.6 million years. However, there are several thousand other faults that have been mapped in Colorado that are believed to have little or no potential for producing future earthquakes. Seismic hazard zone maps and earthquake fault zone maps are used to identify where such hazards are most likely to occur based on analyses of faults, soils, topography, groundwater, and the potential for earthquake shaking that can trigger landslide and liquefaction.

The location of historic epicenters, Quaternary faults, and hazard potential in terms of peak ground acceleration potential in Summit County are displayed in Figure 3-10. As reference, Quaternary faults are those recognized to have moved in the past 1,600,000 or so years, during a portion of the Quaternary geologic epoch (more details on faults and geologic periods below). Peak ground acceleration is used to portray relative ground motion of seismic activity, and it represents the maximum ground acceleration that has a 2% in 50 years of being equaled or exceeded during an earthquake shaking event at the mapped location.

Faults are classified based on the geologic time frame of their latest suspected movement (in order of activity occurrence, with the most recent is listed first):

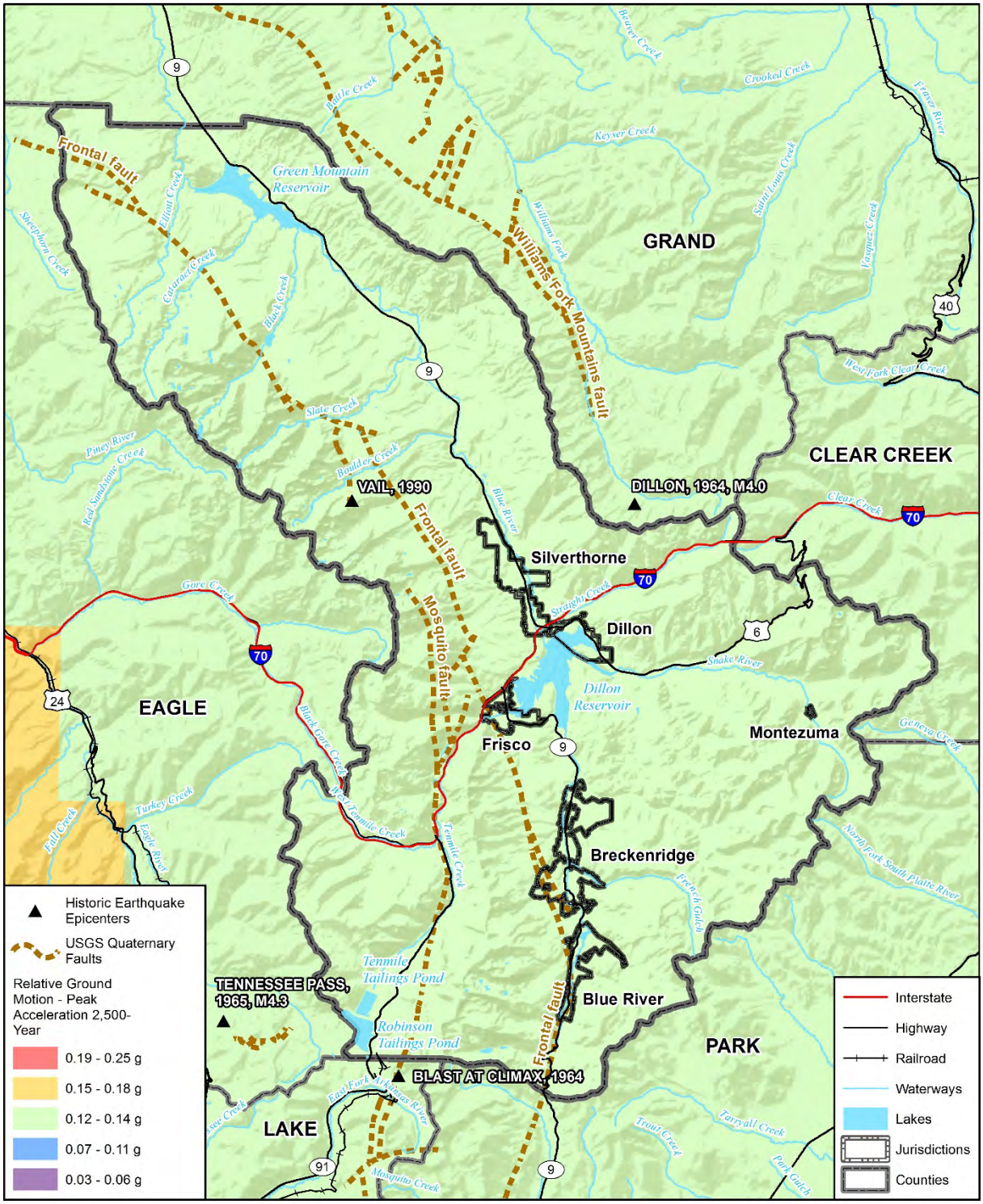
- H—Holocene (within past 15,000 years)

- LQ—Late Quaternary (15,000-130,000 years)
- MLQ—Middle to Late Quaternary (130,000 - 750,000 years)
- Q—Quaternary (approximately past 2 million years)
- LC—Late Cenozoic (approximately past 23.7 million years)

Faults that are considered by the CGS to be sources of damaging earthquakes that could affect the County are the Blue River Graben Faults (LC), Blue River Fault West (LC), Frontal (LQ), Gore (LC), Green Mountain Reservoir Faults (LC), Mosquito (LQ), Mount Powell Faults (LC), and Sheephorn Mountain Faults (LC). Of these faults, the Frontal and Mosquito faults are of most concern to the state. These faults are again depicted on Figure 3-10.

Other faults that could affect Summit County (e.g., other faults that were analyzed by the state for their potential impact on the County but are located outside of the County) are Chase Gulch (LQ), Golden (Q), N Sangre de Cristo (H), N Sawatch (LQ), S Sawatch (H), Ute Pass (MLQ), and Williams Fork (H) (which is in Grand County but very close to the Summit County border). (See Section 3.3.3 Vulnerability Assessment by Hazard for results of the loss estimation analysis conducted for Summit County using FEMA's Hazus software).

Figure 3-10 Earthquake Faults, History, and Hazard Potential in Summit County



Previous Occurrences

The Colorado Geological Survey provided information via the Colorado Earthquake Information database, which was queried for the years 1867-1996. The USGS Earthquake Catalog was also checked for events noted. The following events were found in or nearby the planning area.

- **September 12, 1990**—A magnitude 3.0 earthquake with an epicenter in Vail caused intensity V shaking in Vail, Frisco, and Minturn and intensity III shaking in Silverthorne. It is estimated that the depth of the seismic activity origin was about 5 kilometers.
- **May 29, 1965**—A magnitude 4.3 quake took place in the Tennessee Pass, just a few miles west of the Tenmile and Robinson Tailings Ponds near the southwest boundary of Summit County. It is unknown whether this event affected the planning area, however.
- **1964**—A blast event at the Climax molybdenum mine in 1964 caused quake activity just south of the Summit County boundary, along the Mosquito Fault, and slightly north of the Earth Fork Arkansas River as displayed in Figure 3-10.
- **August 4, 1964**—A magnitude 4.0 earthquake had an epicenter northeast of Dillon, on the boundary with Grand County and just outside Summit County.

Maximum historical earthquake Intensities felt in Colorado have been recorded by the CGS. Summit County has experienced up to Intensity V earthquake shaking. The largest known earthquake in Colorado occurred on November 7, 1882 and had an estimated magnitude of 6.6. The location of this earthquake, which has been the subject of much debate and controversy over the years, is thought to have originated in the northern Front Range west of Fort Collins and north of Estes Park. The quake was felt as far away as Salina, Kansas and Salt Lake City, Utah.

Probability of Future Occurrence

Occasional—Earthquakes have a 1-10% chance of occurrence in the next year in Summit County, equivalent to a recurrence interval of 1 in 11 to 100 years.

Figure 3-10 above includes a probabilistic seismic hazard map of Summit County and surrounding areas, from the USGS and CGS. The background colors depict the probability that ground motion will reach a certain level during an earthquake. It shows the 2% probability of ground shaking in a period of 50 years (as well as the quake epicenters in the mapped area, and the earthquake faults).

Four small events in the County and surrounding areas in the last 130 years approximately equals one event every 32-33 years, or a 3% chance in any given year. None of the noted events caused damages, and the occurrence of earthquakes is relatively infrequent in Colorado. In addition, the historical earthquake record is relatively short (roughly 130 years). However, earthquake hazards in Colorado are not well understood and the potential for unknown active faults exists. While rare, damaging earthquakes can and do occur in Colorado and areas not considered to be earthquake prone. For example, a M 5.3 earthquake and resulting aftershocks damaged homes west of Trinidad, Colorado on August 2, 2011, which was the largest earthquake since 1967.

Magnitude/Severity

Limited—Minor injuries and illnesses expected, along with minimal property damage that does not threaten structural stability, and interruption of essential facilities and services is for less than 24 hours.

As mentioned in previous sub-sections of this hazard chapter, helpful characteristics used to describe and categorize earthquakes and related activity including magnitude, intensity, the effects felt on people and property, and the frequency of occurrence. Those characteristics are summarized in Table 3-9 below.

Table 3-8 Earthquake Magnitude, Intensity Measurements, and Associated Characteristics

Magnitude	Mercalli Intensity	Effects	Frequency
Less than 2.0	I	Microearthquakes, not felt or rarely felt; recorded by seismographs.	Continual
2.0-2.9	I to II	Felt slightly by some people; damages to buildings.	Over 1M per year
3.0-3.9	II to IV	Often felt by people; rarely causes damage; shaking of indoor objects noticeable.	Over 100,000 per year
4.0-4.9	IV to VI	Noticeable shaking of indoor objects and rattling noises; felt by most people in the affected area; slightly felt outside; generally, no to minimal damage.	10K to 15K per year
5.0-5.9	VI to VIII	Can cause damage of varying severity to poorly constructed buildings; at most, none to slight damage to all other buildings. Felt by everyone.	1K to 1,500 per year
6.0-6.9	VII to X	Damage to a moderate number of well-built structures in populated areas; earthquake-resistant structures survive with slight to moderate damage; poorly designed structures receive moderate to severe damage; felt in wider areas; up to hundreds of miles/kilometers from the epicenter; strong to violent shaking in epicentral area.	100 to 150 per year
7.0-7.9	VIII<	Causes damage to most buildings, some to partially or completely collapse or receive severe damage; well-designed structures are likely to receive damage; felt across great distances with major damage mostly limited to 250 km from epicenter.	10 to 20 per year
8.0-8.9	VIII<	Major damage to buildings, structures likely to be destroyed; will cause moderate to heavy damage to sturdy or earthquake-resistant buildings; damaging in large areas; felt in extremely large regions.	One per year
9.0 and Greater	VIII<	At or near total destruction - severe damage or collapse to all buildings; heavy damage and shaking extends to distant locations; permanent changes in ground topography.	One per 10-50 years

Source: USGS

As shown in Figure 3-10, the shaking level that has a 2% chance of being exceeded in Summit County over a period of 50 years is in the range of 12 to 14% peak (light green background color). Western Summit County is in close proximity to the range of 15-18% peak acceleration of gravity (light orange background color), a slightly faster measured change in speed for a particle at ground level that is moving horizontally because of an earthquake. Thus, the western Summit County portions have potential for a greater earthquake risk. Significant earthquake damage typically does not occur until peak accelerations are greater than 19%, however.

As further detailed under Section 3.3.3 Vulnerability Assessment by Hazard, a 2,500 year probabilistic earthquake scenario was performed using FEMA's Hazus 4.2 software. The Hazus loss estimation program was used as part of this mitigation plan's update in 2020 to further quantify the earthquake damage potential in Summit County. The 2,500 year scenario takes into account worst-case ground shaking from a variety of seismic sources. More information on the software and the results of the analysis are provided in Section 3.3.3.

The overall significance rating for this hazard is **Low**.

Climate Change Considerations

Climate change is not expected to affect earthquake frequency or intensity.

3.2.5 Erosion/Deposition

Hazard Description

The Colorado Geological Survey defines erosion as "the removal and simultaneous transportation of earth materials from one location to another by water, wind, waves, or moving ice" and sedimentation (deposition) as "the placing of the eroded material in a new location. All material that is eroded is later deposited in another location."

In Colorado, erosion is generally initiated by water or wind, although human activities greatly influence the rate and extent of erosion and sedimentation. Examples of these activities include removal of vegetation, alteration of natural drainages, and actions that rearrange the earth, such as subdivision development, highway construction, and modification of drainage channels. Erosion and deposition issues are also exacerbated in the burn scars of past wildfires.

Geographic Location

The geographic extent of this hazard in Summit County is limited and occurs in varying rates across the County and State. Soil erosion and the associated deposition have proven to be problems in Summit County due to steep slopes and frequent slide activity.

Sanding on Interstate 70 to improve winter driving conditions also causes major deposition problems. Since the Town of Dillon gets 75% of its water supply from Straight Creek, which runs down from the Continental Divide at the Eisenhower Tunnel, along Interstate 70 and into the Blue River in Silverthorne, the water quality of the creek requires monitoring. Along Highway 6 between Loveland Pass and Keystone, there are numerous places where traction sand has covered U.S. Forest Service land, ultimately ending up in the North Fork of the Snake River.

Human activities such as development influence the rate and extent of erosion and deposition. Construction sites are common point sources of erosion. Chapter 7 of the Summit County Development Code, Water Quality Control Regulations set forth development standards to prevent the degradation of water quality in Dillon and Green Mountain Reservoirs through the reduction of erosion as well as the amount of phosphorus contributed from run-off.

Previous Occurrences

Erosion was a problem during the 2002 drought, when the exposed soils along shorelines of depleted reservoirs created large amounts of dust and air pollution. Data on other specific past events was not available.

In April 2014 a dust storm from the Greater Colorado Plateau blew through Summit County. The result was reddish splotches of dust on the snow leading to impacts to resorts by increasing the rate of snowmelt.

Probability of Future Occurrence

Likely—10-100% chance of occurrence in next year or has a recurrence interval of 10 years or less

Magnitude/Severity

Limited—Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours

In severe conditions, riverine erosion can lead to exacerbated stream bank deterioration; channel instability; loss of agricultural, residential, industrial or private property; loss of infrastructure; and increased sediment loads to downstream reaches. Similarly, sedimentation in an uncontrolled or unmanaged system can lead to loss of channel and reservoir capacity, habitat, and fisheries; decreased channel stability; increased floodplain widths; more variable channel meander patterns; plugging of stormwater outlets; loss of agricultural, residential, industrial, or private property; and increased probabilities of flooding. Undercutting caused by erosion can lead to landslides and rock falls.

Wind erosion can result in dust storms reducing visibility leading to vehicle accidents and can impact machinery. Wind erosion can deposit dust-on-snow, resulting in earlier snowmelt.

Over time, the processes of erosion and sedimentation can have negative impacts on communities and the environment in Summit County. Resultant economic losses may include damage to property and infrastructure and lost recreational or development opportunities.

Climate Change Considerations

Climate change projections show an increase in the intensity of heavy rain events which can result in increased erosion and sediment transport in local water bodies threatening to both water quality as well as the fish and aquatic vegetation the live in the streams and rivers. Higher river levels and faster stream velocity as a result of stronger, more intense storms can also increase erosion. According to the 2018 State of Colorado Hazard Mitigation Plan, the extent of erosion and deposition are expected to increase as the frequency of wildfires increase across the state. Overall, wildfire erosion is expected to increase across Colorado.

Dust-on-snow causes increased snowmelt because dust is darker than snow it absorbs more sunlight causing the snow underneath to heat up more rapidly. This is an emerging factor that could lead to substantial long-term reductions in Colorado's seasonal snow cover. The Center for Snow and Avalanche Studies (CSAS), located in Silverton, Colorado, operates the Colorado Dust-on-Snow (CODOS) program to study the effects of dust on Colorado's snowpack. The program has CSAS sensors at 11 mountain pass locations throughout the state to monitor the presence or absence of dust layers, including Grizzly Peak adjacent to Loveland Pass. As of April 30, 2019, the CODOS reported dust to be more evident and severe compared to the 10 other sites. The Rocky Mountains have been receiving dust since the ice age but the CODOS has seen evidence that the size and frequency of dust storms in the Colorado Mountains have been increasing since the 1990s.

3.2.6 Flood

Hazard Description

Floods involve inundation of normally dry land or other areas. Common types of flooding that can occur in Summit County include riverine flooding, localized or flash flooding (including thunderstorm generated flash floods), stormwater drainage flooding, dam failure inundation and related hazards (see Section 3.2.2), alluvial fan floods and ice jams.

Riverine flooding is defined as when a watercourse exceeds its "bank-full" capacity and is usually the most common type of flood event. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with soils already saturated from previous rain events. It also occurs as a result from snowmelt, in which case the extent of flooding depends on the depth of winter snowpack and spring weather patterns.

A change in environmental conditions or land uses can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels (e.g. leading to flash flooding). These changes are most often created by human activity in developed areas but can also be created by other natural events such as wildland fires and avalanches causing compound effects. For example, 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.

The area adjacent to a river or stream channel is its floodplain. In its common usage, "floodplain" most often refers to that area that is inundated by the 100-year flood, the flood that has a 1% chance in any given year of being equaled or exceeded. The 100-year flood is the national standard to which communities regulate their floodplains through the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP).

Floods can cause substantial damage to structures, landscapes, and utilities as well as cause life safety issues. Certain health hazards are also common to flood events. Standing water and wet materials in structures can become breeding grounds for microorganisms such as bacteria, mold, and viruses. This can cause disease, trigger allergic reactions, and damage materials long after the flood. When flood waters contain sewage or decaying animal carcasses, infectious disease becomes a concern. Direct impacts such as drowning can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts.

According to the latest Summit County Flood Insurance Study, dated November 16, 2018, high water typically occurs on the major waterways by the melting of the winter snow accumulation. When temperatures rise in late springtime and early summer snowmelt runoff increases to peak levels typically in June. Snowmelt runoff levels typically go back to normal flows by mid-July or August. Late summertime rains usually carry a greater chance of flooding than snowmelt runoff does.

According to stream gage records, approximately 97% of the annual peak flows in the Blue River Basin have been the result of melting winter snow accumulations. Spring runoff usually begins the first week in April, increases to a peak by mid-June, and then returns to a normal flow by early August. Rainfall occurs in the basin; however, this is primarily after the peak snowmelt period.

Ice jam flooding also occurs in Summit County. This flooding generally occurs when warm weather and rain break up frozen rivers or any time there is a rapid cycle of freezing and thawing. The broken ice floats down rivers until it is blocked by an obstruction such as a bridge or a shallow area. Ice dams which form can block the main waterway channel and cause flooding upstream (FEMA, 2005).

Swiftwater is water flowing faster than 1.85 kilometers per hour (i.e. considered to be "moving"). This description can easily fit flowing snowmelt waters, flood waters, high sloping waters, and other common flowing water found throughout Summit County, particularly during the peak runoff season. The HMPC

noted that this type of moving water is a public safety concern, and can result in injuries, deaths, or rescues on an almost annual basis.

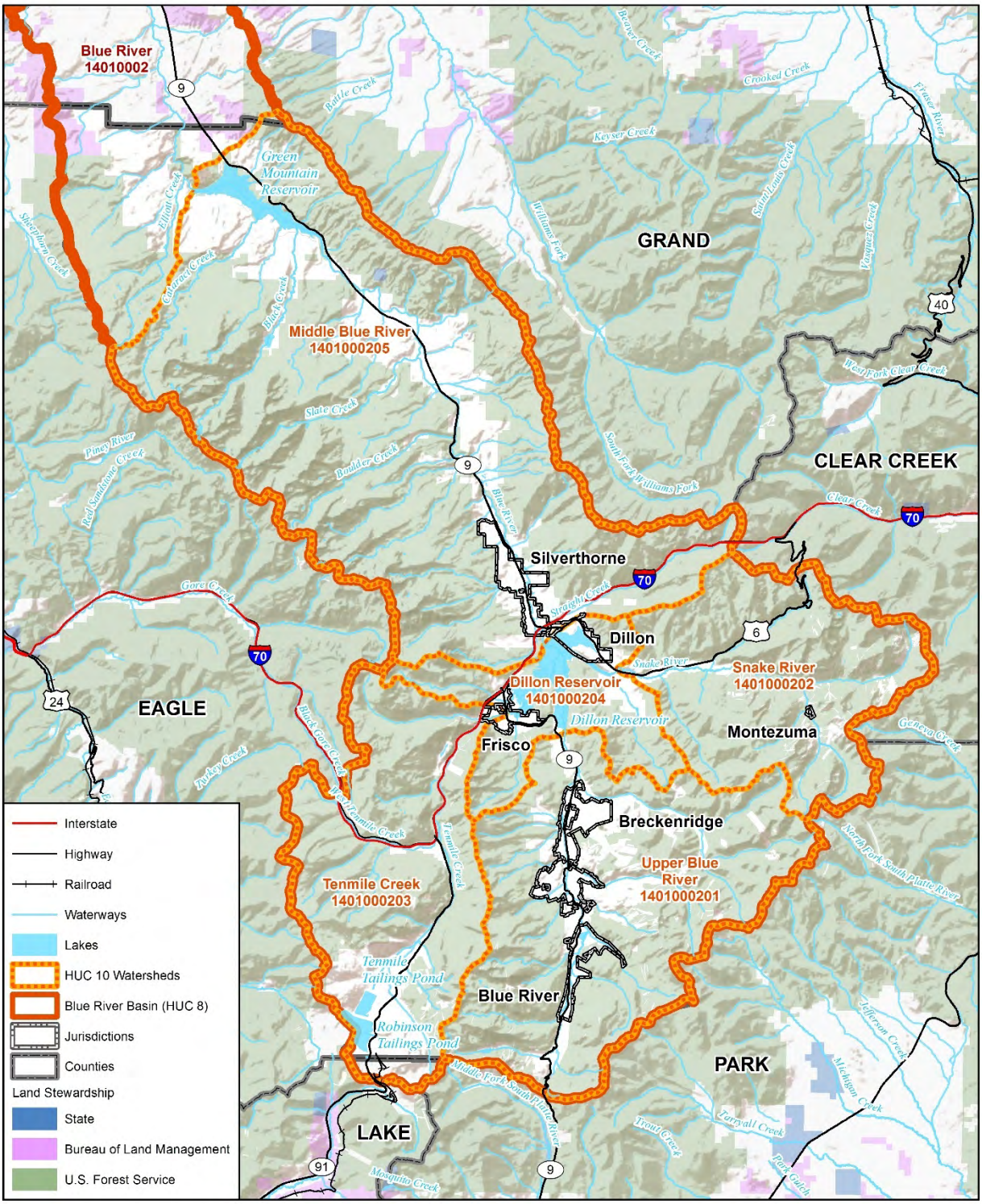
Geographic Location

The geographic extent of flood hazards in Summit County is **Small**—Only 10-25% of the planning area is affected.

The Blue River Basin is the main basin in Summit County (Hydrologic Unit Code, or HUC 8 being 14010002), covering it entirely. It is located on the west side of the Continental Divide and feeds into the Colorado River at the Town of Kremmling in Grand County. The basin is about 683 square miles in size but has a drainage area of 514 square miles, generally draining in a north to northwest direction. The basin width ranges from 21 miles at Dillon Dam to 9 miles at Green Mountain Reservoir. The topography is mountainous with larger rivers in deep broad valleys and smaller creeks in the steep gullies. The basin is bounded by the Continental Divide on the east and south, from Loveland Pass to Fremont pass, while the Gore Rage and Vail Pass form the boundary on the west. The average elevation in the basin is approximately 10,000 feet. There has been little development along the riverbanks of the lower Blue River beyond Silverthorne with the exception of some gravel-mining operations and scattered houses.

Within the larger Blue River Basin are five smaller watersheds, with their classified by HUC 10 codes. These are represented in Figure 3-11 below. They are the Middle Blue River, Dillon Dam, Snake River, Upper Blue River, and Tenmile Creek Basins, described in more detail in the following paragraphs.

Figure 3-11 Basins and Water Features in Summit County



Map compiled 11/2019;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, FEMA, USGS NHD
Note: HUC = Hydrologic Unit Code

Notable streams in the county in terms of flood hazard risk include the Blue River, Snake River, Tenmile Creek, French Creek, Straight Creek, West Tenmile Creek, Boulder Creek, Slate Creek, Sawmill Creek, and smaller tributaries and reaches. These are displayed in Figure 3-11.

In Breckenridge, flooding along the Blue River, Sawmill Gulch, Illinois Gulch, and Lehman Gulch occurs primarily in mid-June and is largely due to snowmelt. County Road 3 is subject to flooding, which threatens access to Peak 7 in Breckenridge. Past flooding in Breckenridge has been mitigated through culvert replacement and changes to the Blue River channel. The channel improvements were made to contain a 100-year flood.

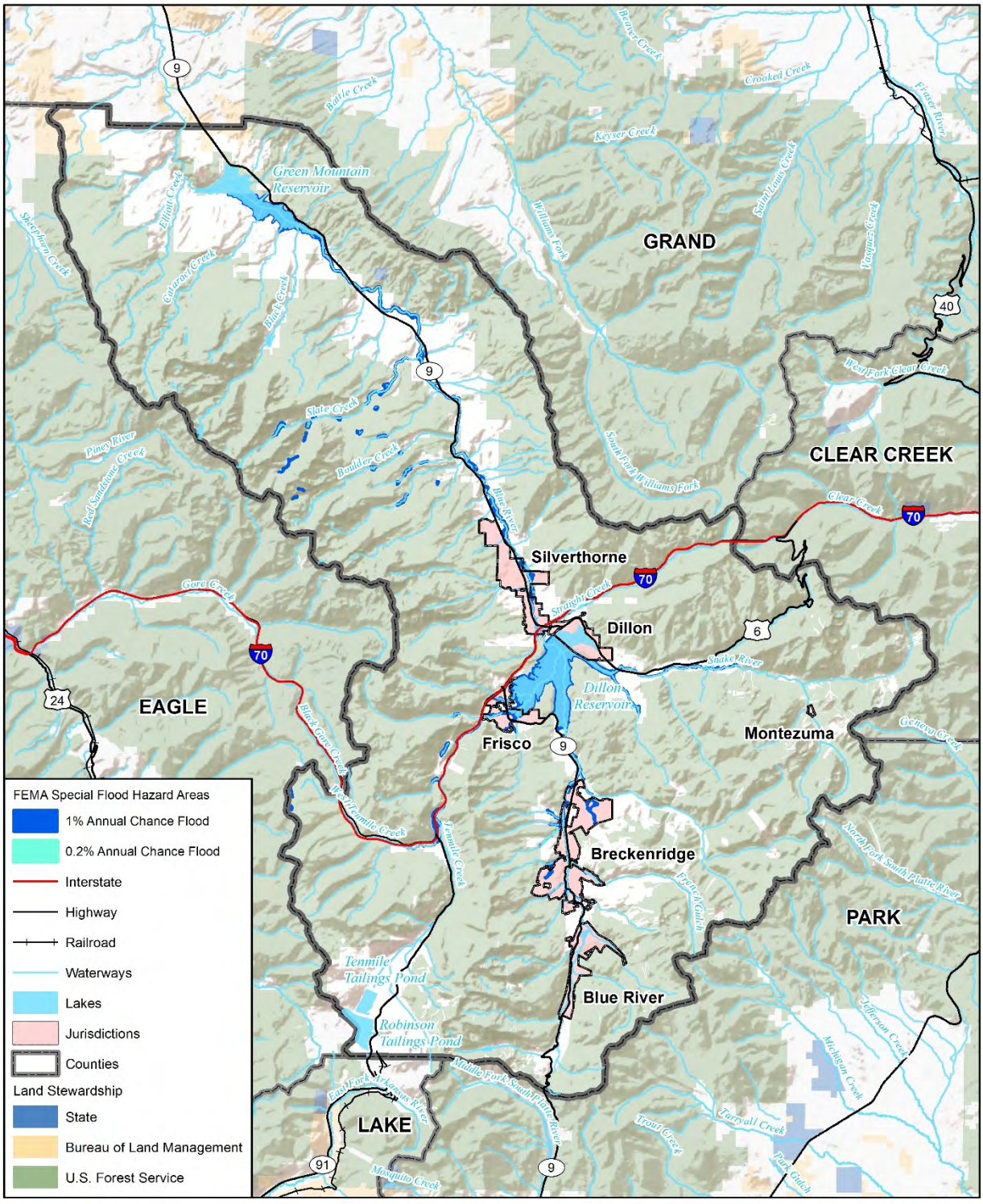
In Frisco, flooding along the Ten Mile and Meadow creeks normally occurs from May through September and results from snowmelt and/or intense storms.

In Silverthorne, flooding along the Blue River, Straight Creek, and Willow Creek normally occurs from April to July. Again, the most common cause is snowmelt. Floodwaters can breach a private road to the south of Willow Creek and cause ponding along State Highway 9. The discharge of the Blue River through Silverthorne is regulated by the Dillon Dam, and the average annual peak discharge downstream of this reservoir is approximately 1,103 cubic feet per second (cfs). Since the Dillon Dam began operating in 1963 there have been no serious flood problems in Silverthorne, and the highest discharge has been around 2,010 cfs (or less than the 10-percent annual chance flood event).

With the exceptions of (incorporated) Dillon and Montezuma, every jurisdiction in Summit County is at risk to riverine flooding based on the FEMA Special Flood Hazard Area layers available to date. Localized stormwater flooding is a fairly minor problem in the communities of Breckenridge, Dillon, and Silverthorne, and is more significant along Main Street in Frisco. More specific information on flooding is provided in the jurisdictional annexes.

According to the November 16, 2018 Flood Insurance Study (FIS) report, the Town of Dillon and Montezuma do not have any Special Flood Hazard areas identified, though localized drainage flooding is possible. The most recent effective flood insurance rate maps (FIRMs) for the County were also published on November 16 of 2018, and there is a complete digital version of these effective products on the FEMA Map Service Center. Since the last HMP update, portions of the then preliminary Digital FIRM (DFIRM) were made into effective products and only slightly changed. A Letter of Map Revision, or LOMR, for the Town of Breckenridge was approved on January 13, 2020. This LOMR updates the basemap, floodway, hydraulic analyses, and topographic data for the area along Wellington Road at its divergence from French Gulch.

Figure 3-12 FEMA Special Flood Hazard Areas in Summit County



Map compiled 10/2019;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, FEMA NFHL

wood.

As noted under subsection 3.2.2 Dam Incidents releases from Dillon Dam during periods of high inflows could have flooding impacts on the Town of Silverthorne. The Dillon Dam Reservoir is currently located in the Dillon Reservoir Basin and receives flows from the three principal basins upstream of it: Upper Blue River, Snake River, and Ten Mile Creek Basins. The reservoir storage significantly reduces peak discharges and flood frequency downstream and is also used to control discharges of the Blue River through Silverthorne to the Green Mountain Reservoir. The primary functions of the Green Mountain and Dillon Reservoirs are to provide water for recreational uses, generate hydroelectricity, and collect and storage snowmelt runoff for domestic use on the eastern slope.

The Goose Pasture Tarn, a small reservoir immediately upstream of Breckenridge, also serves as a flood protection measure for the Upper Blue River. The reservoir is important in reducing the peak discharge of the Upper Blue River and smaller Indiana Creek due to rainfall but is only marginally effective for runoff due to snowmelt.

The changes that have been made in the Blue River Middle Branch channel through part of Breckenridge has reduced some flood potential in the town. The improvements were made with the intention to contain a 1% annual chance flood. During a 1% annual chance flood event much of the flow, which previously would have spilled over the banks, will now be confined to the channel, particularly in the areas from the northern corporate limits to approximately 400 feet downstream of Watson Road; from approximately 600 feet downstream of Lincoln Avenue to the Washington Avenue footbridge; and, in the area of the Four Seasons shopping center.

Previous Occurrences

According to the latest Summit County FIS report as well as the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) storm database, there is little evidence of significant flooding in Summit County in recent years. Noted exceptions from the studies, NCEI, and the HMPC input include the following:

- **June 3, 2014**—The Town of Montezuma suffered major road and infrastructure washouts due to flooding which began on the 3rd of June. Flood waters from the Snake River destroyed the main road to the town (Montezuma Road), clogging a culvert and leading to the road being washed out. An estimated 20 residents were stranded for days due to the washout. A new bridge was installed to replace the 60 inch culvert which failed, which restored access to and from Montezuma and should mitigate future events.
- **July 18, 2011—**Thunderstorms produced very heavy rain and continuous lightning over Summit County. The historic rainstorm in the Town of Breckenridge produced 3.17 inches of rain at the local weather station. Most of the rain fell in less than 3 hours. A cooperative observer with the National Weather Service also recorded 3.59 inches of rainfall in east Breckenridge. The highest recorded 24-hour rainfall prior to this event occurred in the early 1890s when 2.6 inches were observed. Nearly 3,900 cloud to ground lightning strikes were also recorded during the 3-hour span. The steeple of the Father Dyer Church in Breckenridge sustained a direct hit from one of those strikes, damaging the structure. The heavy rainfall produced a large landslide a few miles above Dillon where a section of tree line collapsed. Large amounts of sediment partially covered a section of Straight Creek, which is the main water supply to thousands in the area. In addition, mudslides closed a portion of State Highway 9 north of Dillon and Airport Road in Breckenridge. Extensive flooding also forced the closure of Breckenridge Golf Course for several days. Extensive flooding damaged the Breckenridge Golf Course. Property damage was estimated at $200,000 and crop damage was estimated at $10,000.

- **July 12, 2011—**Following heavy rains, the Blue River at Coyne Valley Road washed out the road. The Barton Creek Pond at Coyne Valley Road and Airport Road overtopped and the culvert at Airport Road overflowed, forcing the road to be closed. A privately owned dam at 7th Street in Frisco overtopped, but the situation was stabilized before any significant damages occurred.
- **June 8, 2011—**The Blue River in Breckenridge was running near bank full in low areas behind the Justice Center and Breckenridge Recreation Center. Work was done behind the Breckenridge Street Department to add fill dirt to an 18" diameter sink hole that developed on the south shoulder of Coyne Valley Road above the primary culverts. The culverts in the area were running full, and the overflow culverts to the east moved water to the north side of the road near the bike path. The Swan River was running full, and a culvert was washed out at the driveway to Everist Materials at the Mascot Placer location in Breckenridge. In the 3200 block of Tiger Road a culvert overflowed, and 6 to 12 inches of standing water caused some road damage. Hamilton Creek in the South Forty subdivision was also running full, causing some local yard flooding to homes in the area. A private culvert was washed out over the weekend.
- **February 2007**—A frozen culvert caused water backup from a Reynolds Reservoir overflow, causing minimal water damage to a home in Summit Cove and the closure of Summit Drive for part of a day. Sandbagging kept damage to a minimum.
- **2003 and 1983—**St. John Road and Morgan Gulch in the Town of Montezuma have flooded in the past. The flood impacted Montezuma Road, Main Street, St. John Road, and 5th Street. The events did not result in any impact to local businesses or the economy at the time but would today. Roads and ditches were damaged, causing road closures. No injuries or fatalities occurred.
- **Spring 1996**—Flooding occurred on the Blue River in Breckenridge and on Straight Creek in Dillon Valley. Straight Creek Drive was washed out and a larger culvert was installed to mitigate future events.
- **July 23, 1965**—Rainfall runoff from a high-intensity storm centered over a small tributary above Breckenridge caused flooding along the Blue River. Damage was not very extensive. Other rivers in the County were also at their peaks during this storm.
- **June 17, 1965**—One of the largest discharges recorded during the 64 years of record on the Blue River near Dillon was 1,250 cfs. The high discharge was a result of snowmelt and high-intensity thunderstorm centered on a tributary above Breckenridge. This flood was a 2% annual chance event (i.e. 50-year flood storm).
- **1918**—The longest flood of record prior to the construction of the Dillon Dam took place this year, when the combined flow of the Blue River, Tenmile Creek, and the Snake River was around 3,500 cfs, just upstream from the present location of Silverthorne.

The HMPC commented that 2014 flood induced losses on Montezuma Road have been due to undersized culverts, so that the main road to Montezuma required closure. As a result of this event, culverts in the area were replaced with a bridge. Other HMPC noted issues with flooding include the replacement of Summit Cove culverts with another bridge (to be able to handle 100-year flooding), and the work performed by the Dillon Valley District to replace culverts.

The USACE Ice Jam Information Clearinghouse recorded 15 ice jam events in Summit County between 1955 and 2019. Affected areas included Dillon and the Green Mountain Reservoir, along the Blue River, Rock Creek, Snake River, and Keystone Gulch. Also, the HMPC noted ice jam issues near the Upper Blue Lake Dam in recent times, which led in the flooding of two houses along Highway 9. Because of issues like this, Summit County has been working with Colorado Springs Utilities to divert water from this dam, as well as increase sandbagging and install pumps.

Probability of Future Occurrence

Likely—There is a 10-100% chance of flood occurrence in next year or has a recurrence interval of 10 years or less.

The HMPC suggests that some level of flooding is almost an annual occurrence in Summit County. Zone A floodplains are often called the '100-year' flood zone, but really have a 1% annual chance of flooding any given year. In addition, based on the presence of 0.2% annual chance floodplains, or the '500-year' flood extents, it would be expected that events of this nature may take place in the future. The various FEMA zones applicable to Summit County are defined in Table 3-10. The flood map represents different flood zones as defined by FEMA.

Table 3-9 FEMA Special Flood Hazard Zones

Flood Zone	Definitions
FEMA Special Flood Hazard Areas (SFHA) Subject to Inundation by the 100- or 500-Year Floods	
Zone A	100-year floodplain, or areas with a 1% annual chance of flooding. Because detailed analyses are not performed these areas, no depths or base flood elevations are shown in Zone A areas.
Zone AE	Detailed studies for the 100-year floodplain. The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 zones.
Zone AH	Areas with a 1% chance of shallow flooding, usually in the form of a pond with an average depth ranging from 1 to 3 feet. These are flood elevations derived from detailed analyses.
Zone AO	River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. Average flood depths derived from detailed analyses.
Other Flood Areas	
Floodway	A regulatory floodway is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
Zone X (shaded)	Areas with a 0.2% annual chance flooding (1 in 500 chance), between the limits of the 100-year and 500-year floodplains. This zone is also used to designate base floodplains of lesser hazards, such as areas protected by levees from the 100-year flood, shallow flooding areas with average depths of less than one foot, or drainage areas less than 1 square mile.
Zone X (unshaded)	500-year floodplain (0.2% annual chance). Area of minimal flood hazard.

Source: FEMA Flood Map Service Center, 2018

Magnitude/Severity

Critical—Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours.

Because of the nature of floods, it is always possible that large events may cause injuries or deaths. Flood water, debris from steep tributary channels, ice jams, dam failure-induced inundation, and even swiftwater related events can damage property and infrastructure and lead to road closures. However, past flood

damages have been limited in terms of damages to property and crops and resulted in no injuries or deaths.

The overall significance rating for this hazard is **High**.

Climate Change Considerations

The 2014 Climate Change Assessments from the Western Water Assessment program (part of the NOAA Rise Team) includes a projection for sporadic but more intense heavy precipitation events, which could affect the nature and frequency of future floods. Additionally, with wildfires already being a problem in many parts of Colorado, increasing periods of drought and lack of precipitation are expected to exacerbate conditions for fires to occur, and in turn worsen the potential for runoff and flooding associated with burned areas.

3.2.7 Hazardous Materials Release

Hazard Description

Generally, a hazardous material is a substance or combination of substances which, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. Hazardous materials may also pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous material incidents can occur while a hazardous substance is stored at a fixed facility, or while the substance is being transported along a road corridor or railroad line or via an enclosed pipeline or other linear infrastructure.

The U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) all have responsibilities relating to the transportation, storage, and use of hazardous materials and waste. The Right to Know Network, maintained by the U.S. Coast Guard's National Response Center (NRC), is a primary source of information on the use and storage of hazardous materials, as well as data regarding spills and releases. In Colorado, the manufacture, use, storage, and transportation of hazardous materials is regulated by the Colorado Department of Public Health and the Environment (CDPHE). Hazardous materials carriers are subject to Colorado Public Utility Commission (PUC) registration and insurance requirements. Colorado statutes require that any person transporting hazardous materials that require placarding to obtain a Hazardous Materials Permit from the Public Utilities Commission. Safety oversight is the jurisdiction of the Colorado State Patrol.

Hazardous materials are typically divided into the following classes:

- Explosives
- Compressed gases: flammable, non-flammable compressed, poisonous
- Flammable liquids: flammable (flashpoint below 141 degrees Fahrenheit) combustible (flashpoint from 141 - 200 degrees)
- Flammable solids: spontaneously combustible, dangerous when wet
- Oxidizers and organic peroxides
- Toxic materials: poisonous material, infectious agents
- Radioactive material
- Corrosive material: destruction of human skin, corrodes steel

It is also common to see hazardous materials releases result as escalating incidents from other hazard incidents such as floods, wildfires, and earthquakes. The release of hazardous materials can greatly complicate or even eclipse the response to the natural hazards disaster that caused the spill.

Geographic Location

Hazmat incidents can occur at fixed facilities or during transportation, as discussed below. Overall, the geographic extent of this hazard in Summit County is **isolated -** less than 10% of the planning area affected - (based on historical experience) but depending on the type and quantity of spill and the medium affected, the geographic extent could become large.

Fixed Facilities

Generally, with a fixed facility, the hazards are pre-identified. The U.S. Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 requires industries to report on the storage, use, and releases of hazardous substances to federal, state, and local governments. Facilities in Colorado must submit an emergency and hazardous chemical inventory form (Tier II form) to the Colorado Department of Public Health and Environment (CDPHE) and, if required by local reporting regulations, the Local Emergency Planning Committee (LEPC) and local fire departments annually. Tier II forms provide state and local officials and the public with information on the general hazard types and locations of hazardous chemicals present at facilities during the previous calendar year. The inventory forms require basic facility identification information, employee contact information for both emergencies and non-emergencies, and information about chemicals stored or used at the facility. The EPA also requires facilities containing certain extremely hazardous substances to generate Risk Management Plans (RMPs) and resubmit these plans every five years.

The Summit County Office of Emergency Management administers the Emergency Planning and Community Right-to-Know program for the planning area through the LEPC. As of November 2019, there are 17 Tier II facilities and no RMP facilities in Summit County; these facilities are listed in Table 3-11 below. Similarly, CDPHE does not list any permitted hazardous waste facilities in the county.

Table 3-10 Reporting Tier II Facilities in Summit County

Name	Jurisdiction	Fire Protection District
AmeriGas Propane Company	Summit County	Red, White, and Blue Fire Protection District
Breckenridge Ski Resort	Summit County	Red, White, and Blue Fire Protection District
CenturyLink Communications	Summit County	Copper Mountain Fire Department
CenturyLink Communications	Frisco	Summit Fire & EMS
CenturyLink Communications	Breckenridge	Red, White, and Blue Fire Protection District
CenturyLink Communications	Dillon	Summit Fire & EMS
Climax Mine	Summit County	Copper Mountain Fire Department
Comcast of Colorado V, LLC	Silverthorne	Summit Fire & EMS
Excel Energy	Silverthorne	Summit Fire & EMS
Ferrellgas	Frisco	Summit Fire & EMS
Keystone Ski Resort	Summit County	Summit Fire & EMS

Name	Jurisdiction	Fire Protection District
Lowes	Silverthorne	Summit Fire & EMS
RSC Equipment Rental, Inc	Summit County	Red, White, and Blue Fire Protection District
UPS	Silverthorne	Summit Fire & EMS
Verizon	Summit County	Summit Fire & EMS
Vista Auto Group	Silverthorne	Summit Fire & EMS
Waste Management	Silverthorne	Summit Fire & EMS

Source: HMPC

Abandoned Mines

A subset of fixed facilities are abandoned mines, many of which may contain large quantities of hazardous materials related to mine waste and contaminated water. Hazardous materials associated with mining materials was added to this plan in 2020 in part due to the 2015 Gold King mine toxic wastewater release in San Juan County. The Colorado Division of Reclamation, Mining, and Safety (DRMS) estimates there are approximately 23,000 abandoned mines in Colorado, including several in Summit County. DRMS tracks information on 230 mines that are currently draining water with the potential to impact water quality; 13 of these mines are located in Summit County and shown in Table 3-12. DRMS is working to identify remediation options for these mines.

Table 3-11 Mines in Summit County with the Potential to Impact Water Quality

Mine	UTM X	UTM Y	Status
Wellington/Oro	412730.00	4370921.00	Partial to complete restoration
Delaware	430185.00	4383026.00	Recent investigation or restoration project in process
Pennsylvania Mine Level C	430341.00	4383395.00	Recent investigation or restoration project in process
Pennsylvania Mine Level F	430530.00	4383648.00	Recent investigation or restoration project in process
Saints John	424573.00	4380427.00	Recent investigation or restoration project in process
Silverspoon	429973.00	4382229.00	Recent investigation or restoration project in process
Germania	411237.00	4369440.00	No recent investigations or restoration projects
Jumbo Mine	426736.00	4383481.00	No recent investigations or restoration projects
Morgan Mine	426569.00	4381819.00	No recent investigations or restoration projects
Puzzle/Unnamed Adit	411487.00	4369381.00	No recent investigations or restoration projects
Puzzle/Willard Tunnel	411506.00	4369298.00	No recent investigations or restoration projects
Shoebasin	431393.00	4384781.00	No recent investigations or restoration projects
Swan River Mine	417134.00	4374992.00	No recent investigations or restoration projects

Transportation

In transit, hazardous materials generally follow major transportation routes, including road, rail, and pipelines, creating a risk area immediately adjacent to these routes. Summit County is particularly concerned about the transport of hazardous materials on Interstate 70 (I-70) and U.S. 6. I-70 serves as a major east-west corridor for the state and the nation. Closure of the road due to a hazardous materials incident would significantly disrupt traffic flow between the Denver metropolitan area and the western slope of the Rocky Mountains and could cause severe economic impacts to the Summit County area. Similarly, the economies of Dillon and the Keystone and Arapahoe Basin ski areas are all dependent on

U.S. 6 and would be severely impacted if an incident were to occur on the route, especially one that caused soil or water contamination.

Hazardous materials trucks, such as gas tankers, are not allowed passage through the Eisenhower/Johnson Memorial Tunnels on I-70 and are routed to U.S. 6 and over Loveland Pass, which is a mountain pass with tight switchbacks and steep grades. The purpose of this detour is to mitigate the potential for a hazardous materials incident within the tunnels. There are exceptions to this procedure when adverse winter weather closes Loveland Pass. In such an event, CDOT closes the tunnel to regular traffic for roughly 15 minutes at the top of the hour and escorts vehicles transporting hazardous materials through the tunnel.

There are no airports in Summit County, thus the potential for air incidents is minimal. The only rail line in the County is a rail hub near the Robinson Tailings Pond in the southwest corner of the County, so the potential for rail incidents is similarly minimal.

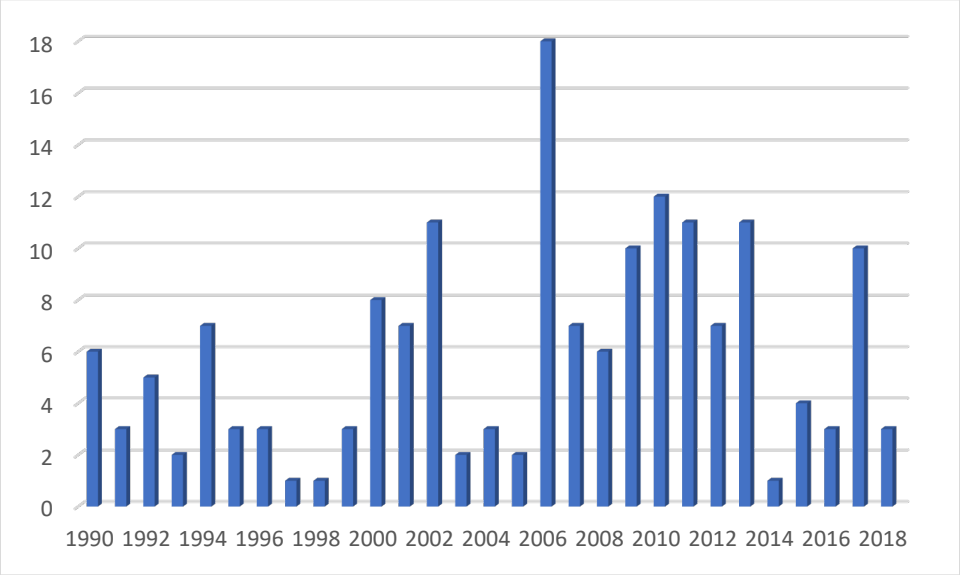
Natural gas pipelines do traverse the County, primarily alongside I-70 and State Highway 9. Pipeline ruptures can result in major spills or even explosions.

Hazardous material incidents can also occur in agricultural areas; these types of facilities typically use pesticides, fertilizers, and other agricultural chemicals that are harmful to people and the environment. For example, agricultural pesticides and fertilizers are often transported daily around the planning area. Illegal drug operations and dumping sites have also been known to pose a hazardous materials threat.

Previous Occurrences

Minor hazardous materials incidents occur regularly in Summit County, but historically the impacts of those incidents have been minor. Statistics from the National Response Center (NRC), which serves as the primary national point of contact for reporting all oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories, indicate that between 1990 and the end of 2018, 170 hazardous materials incidents were reported in Summit County. This number almost certainly excludes a number of very small spills that were not reported to the NRC. This translates to an average of 5.86 incidents per year. The trend over the last 29 years shows fewer incidents in the 1990s (average of 3.4 incidents per year), with the number of incidents more than doubling during the 2000s (average of 7.4 incidents per year), followed by a slight decline during the 2010s (average of 6.9 incidents per year).

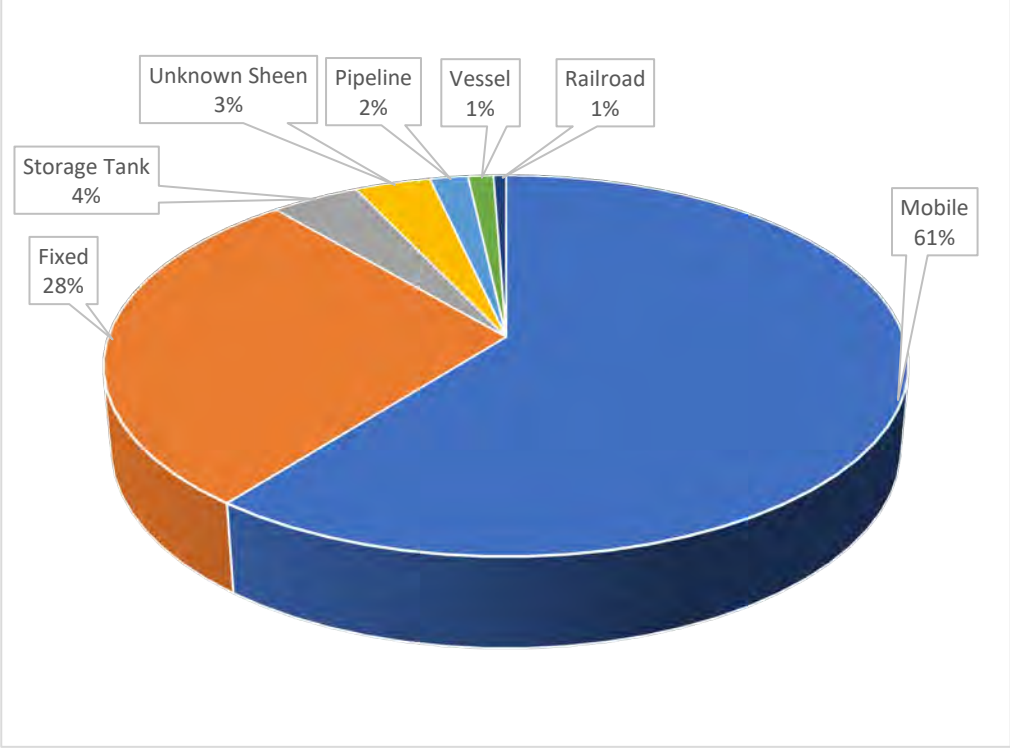
Figure 3-13 Hazardous Materials Incidents Reported in Summit County, 1990-2018



Source: http://nrc.uscg.mil/

As shown in Figure 3-15, nearly two-thirds of these incidents occurred during transportation (road, pipeline, rail & vessel), with the remaining third occurring at fixed locations.

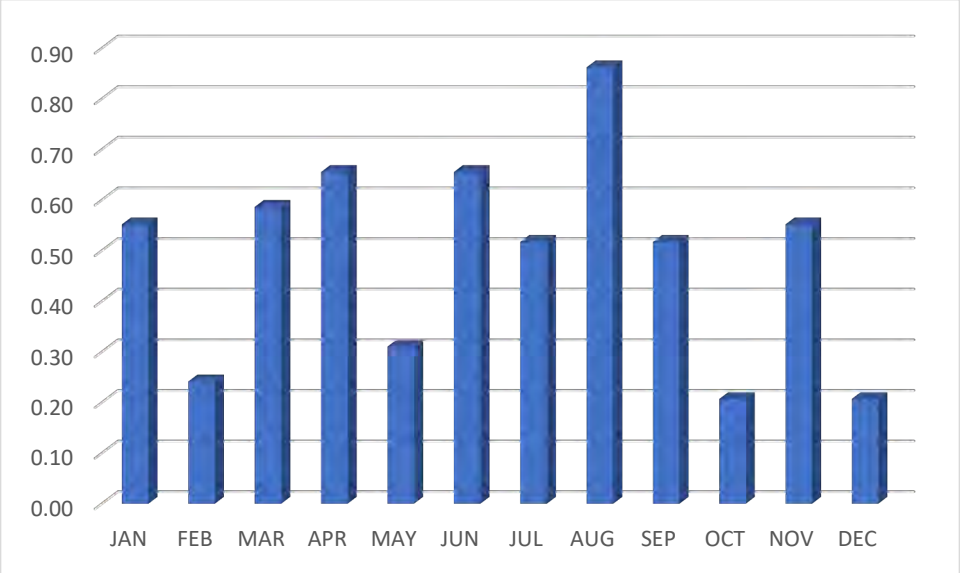
Figure 3-14 Hazardous Materials Incidents By Type, 1990-2018



Source: http://nrc.uscg.mil/

Figure 3-16 shows the average number of hazardous materials incidents in Summit County in a given month; hazardous materials incidents can happen during any month, but are most common in August, April, and June, and least common in October, December, and February.

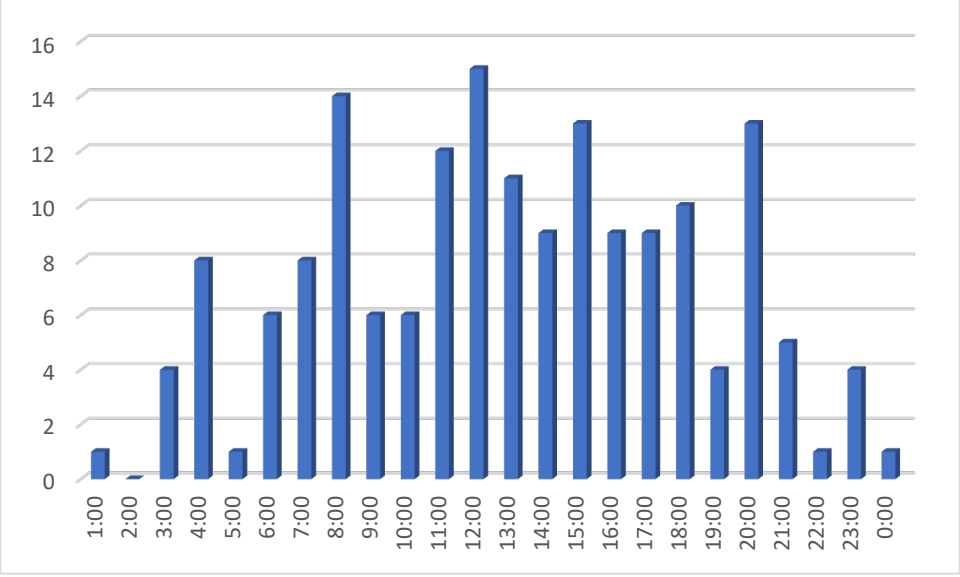
Figure 3-15 Hazardous Materials Incidents By Month, 1990-2018



Source: http://nrc.uscg.mil/

While hazardous materials incidents can happen at any time of day, Figure 3-17 shows they are most common during daylight hours, particularly during the afternoon.

Figure 3-16 Hazardous Materials Incidents By Time Of Day, 1990-2018



Source: http://nrc.uscg.mil/

The vast majority of these 170 reported incidents had no significant impacts. NRC data from 1990 through 2018 lists only 28 hazardous materials incidents in Summit County that resulted in injuries, fatalities, or significant property damage – an average of one per year. Between them, those 28 incidents resulted in 8 fatalities, 43 injuries (26 of which required hospitalization), 1 evacuation of 400 people, and $70,000 in property damage. However, it is important to note that the NRC counts all injuries or damages resulting from an accident where hazardous materials were involved, whether or not the injuries or damages were caused by exposure to the hazardous substance; closer analysis shows that at least half of those injuries, fatalities, and property damage were from the physical impacts of the accident.

Specific notable hazardous materials incidents in the County include the following:

- **May 30, 2012** — The Lake Dillon FPD (now known as Summit Fire & EMS) responded to a lime spill along eastbound I-70 at mile marker 204. Hazmat team members of Red, White, and Blue FPD, Copper Mountain Fire, and Colorado State Patrol Hazmat also responded to the incident. Roughly 400 pounds of high-grade lime spilled off of the back of a flatbed trailer. The event threatened the watershed, and I-70 eastbound was closed for 8 hours while the spill was addressed. The driver of the trailer was injured. Two CDOT workers were working in the spill area to remove some of the lime from the roadway and had to undergo emergency decontamination. Hazmat crews, with the assistance of CDOT, were able to clean much of the spill before deciding to hire a private clean-up contractor.

Figure 3-17 Lake Dillon FPD Responding to Lime Spill on Eastbound I-70

Source: Lake Dillon FPD

- **December 15, 2010** — A chlorine gas leak was reported at one of the Town of Frisco's domestic water wells located next to Ferrell Gas. An operator was changing out a chlorine tank when it malfunctioned and caused the leak. The affected area was located at the intersection of Summit Boulevard and Main Street in Frisco. As a precaution all immediate surrounding areas were evacuated, and traffic was diverted. Highway 9 was closed from School Road south to CR 1040 or Peak One Boulevard. Traffic was directed to alternate routes through Frisco. The Fire Department contained the leak at approximately 4:00pm.
- **November 10, 2010** — Lake Dillon FPD dealt with another hazmat transportation spill after four hundred bags of sodium hydroxide spilled off of an overturned semi-trailer along Highway 6 about 1 mile east of Dillon. The spill threatened Dillon Reservoir and forced Highway 6 to close for 7 hours. The driver of the trailer was injured.
- **June 10, 2010** —A semi-trailer overturned, injuring the driver and spilling roughly 12,000 gallons of gas and diesel. An explosion ensued, but fortunately no additional casualties occurred. The event transpired along Highway 6 about 1.5 miles east of Arapahoe Basin Ski Area. Highway 6 was closed for 8 hours, and the watershed was threatened. Lake Dillon FPD responded to this event as well.
- **April 28, 2006** — A double box trailer truck combination overturned on U.S. 6 on the west side of Loveland Pass, closing the highway. The two trailers were reportedly carrying eight different types of hazardous products. Some of the products spilled and appeared to have reached a stream. There was concern that the products would contaminate water sources that could affect Denver Water, the Snake River Water District, and Dillon Reservoir.
- **2003** — A tanker rolled into the oncoming lane on I-70 near the Copper Mountain Fire Station and closed the interstate for 18 hours. The tanker spilled between 950-1,000 gallons of gasoline, which ran down the interstate under the snow into a storm drain.
- **July 7, 1997**— A gasoline tanker spilled fuel on U.S. Highway 6 near Keystone. Highway 6 had to be closed, and the event necessitated ground water contamination monitoring. One death was associated with the event.

Figure 3-18 Lake Dillon FPD Responding to Fuel Spill and Explosion on Highway 6

Source: Lake Dillon FPD

Probability of Future Occurrence

Likely—10-100% chance of occurrence in next year or has a recurrence interval of 10 years or less

Hazardous materials incidents occur in Summit County every year. While the County experiences five to six hazardous materials incidents per year on average, incidents causing injuries, fatalities, damage, or evacuations occur only once a year on average. The majority of incidents are transportation related, and most are fuel spills that are not related to the cargo being transported. Based on previous experience, the probability of a spill of a nonfuel hazardous material or a spill with significant impact to people, the environment, or the economy is much less likely.

Magnitude/Severity

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons and radioactive materials. Hazards can occur during production, manufacturing, storage, transportation, use, or disposal. Impacts from hazardous materials releases can include:

- Fatalities
- Injury
- Evacuations
- Property damage
- Animal fatalities (livestock, fish & wildlife)

- Air pollution
- Surface or ground water pollution/contamination
- Interruption of commerce and transportation

Numerous factors influence the impacts of a hazardous materials release, including the type and quantity of material, location of release, method of release, weather conditions, and time of day. This makes it difficult to predict precise impacts. The impact to life and property from any given release depends primarily on:

- The type and quantity of material released.
- The human act(s) or unintended event(s) necessary to cause the hazard to occur.
- The length of time the hazard is present in the area.
- The tendency of a hazard, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space.
- Characteristics of the location and its physical environment that can either magnify or reduce the effects of a hazard.

The release or spill of hazardous materials can also require different emergency responses depending on the amount, type, and location of the spill incident.

The impact of major hazardous materials incidents are potentially **catastrophic**, causing multiple deaths, property damage, and/or interruption of essential facilities and service for more than 72 hours. However, historically the impact of hazardous materials incidents in Summit County have been **Limited**.

Climate Change Considerations

There are no known effects of climate change on human-caused hazards such as hazardous material incidents.

3.2.8 Landslide, Mudflow/Debris Flow, Rock Fall

Hazard Description

A *landslide* is a general term for a variety of mass-movement processes that generate a downslope movement of soil, rock, and vegetation under gravitational influence. For the purposes of this plan, the term "landslide" includes mudslides, debris flows, and rock falls. Some of the natural causes of ground instability are stream and lakeshore erosion, heavy rainfall, and poor quality natural materials. In addition, many human activities tend to make the earth materials less stable and thus increase the chance of ground failure. Human activities contribute to soil instability through grading of steep slopes or overloading them with artificial fill, by extensive irrigation, construction of impermeable surfaces, excessive groundwater withdrawal, and removal of stabilizing vegetation.

A *mudslide*, in particular, is a mass of water and fine-grained earth materials that flows down a stream, ravine, canyon, arroyo, or gulch. If more than half of the solids in the mass are larger than sand grains (e.g., rocks, stones, boulders), the event is called a *debris flow*. Many of Colorado's older mountain communities built in major mountain valleys are located on or near debris fans. A debris fan is a conical landform produced by successive mud and debris flow deposits, and the likely spot for a future event of this nature. The mud and debris flow problem can be exacerbated by wildfires that remove vegetation that serves to stabilize soil from erosion. Heavy rains on the denuded landscape can lead to rapid development of destructive mudflows.

A *rock fall* 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 rock falls. Rock falls 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 rock fall. Rocks in a rock fall can be of any dimension, from the size of baseballs to houses. Rock fall occurs most frequently in mountains or other steep areas during the early spring when there is abundant moisture and repeated freezing and thawing.

Landslides, mudslides, debris flows, and rock falls occur commonly throughout Colorado, and often damage buildings and infrastructure. California, Washington, and Colorado were the first three states to use federal disaster funds to acquire property in landslide hazard areas as a mitigation measure to prevent damages and potential injuries to people.

Geographic Location

The geographic extent of landslide hazards in Summit County is **Medium**—around 32% of the planning area is potentially at risk.

According to the 2002 update to the 1988 Colorado Landslide Mitigation Plan, a landslide complex on the south side of Green Mountain Reservoir in the community of Heeney is a tier two landslide/rock fall area. Geologic hazards mapping by the Colorado Geological Survey shows a large old landslide that includes all of Heeney and adjacent developed shore area for about 1.5 miles. Although there were no signs of large scale active sliding on the old landslide, it was considered to have the potential to become a large and serious landslide that could threaten the community and the reservoir. This hazard area encompasses approximately 710 acres.

According to the Heeney/Green Mountain Reservoir Subbasin Plan, low water levels in the reservoir in 2002 created heightened concerns about the landslide potential in the area. Homes began to noticeably slip, and the last time that happened was in 1963, when a rapid drawdown of the water resulted in the loss of several homes. In 2002, the dramatic drop in water levels did not give the shoreline time to dry and solidify. It is anticipated that low reservoir levels in the future, as a result of possible drought conditions and high demand from water users downstream, will pose development challenges. The Bureau of Reclamation is monitoring the problem. Thus far there have been no further issues.

According to the HMPC, other problem areas in Summit County include Keystone Mountain's condo area, a slump on I-70 west of the Eisenhower/Johnson Memorial tunnels at mile marker 212 (approximately 23 acres), Quandary Village (approximately 4 acres), and Mesa Cortina in Silverthorne (approximately 14 acres).

The slump on I-70 at mile marker 212, known as the "Big Bump," is a slow but persistent landslide that subsides a few inches each year. Spring snowmelt and runoff soaks into the layers of rock and soil underlying the asphalt, creating conditions for a landslide. Slope instability is exacerbated by the fact that the eastbound lanes over this stretch of I-70 were built on fill excavated from the Eisenhower/Johnson Tunnel as it was being built in the 1970s. CDOT repaves the slump regularly to level out that portion of the road, but this only serves as a temporary fix. The asphalt at that location is now 6 to 7 feet deep after decades of repaving. Although it has not happened yet, there is a very real chance that a catastrophic slide could occur. Long-term solutions to the problem would prove extremely difficult and exorbitantly expensive to implement. The proposed solutions would necessitate closing that stretch of I-70 for several

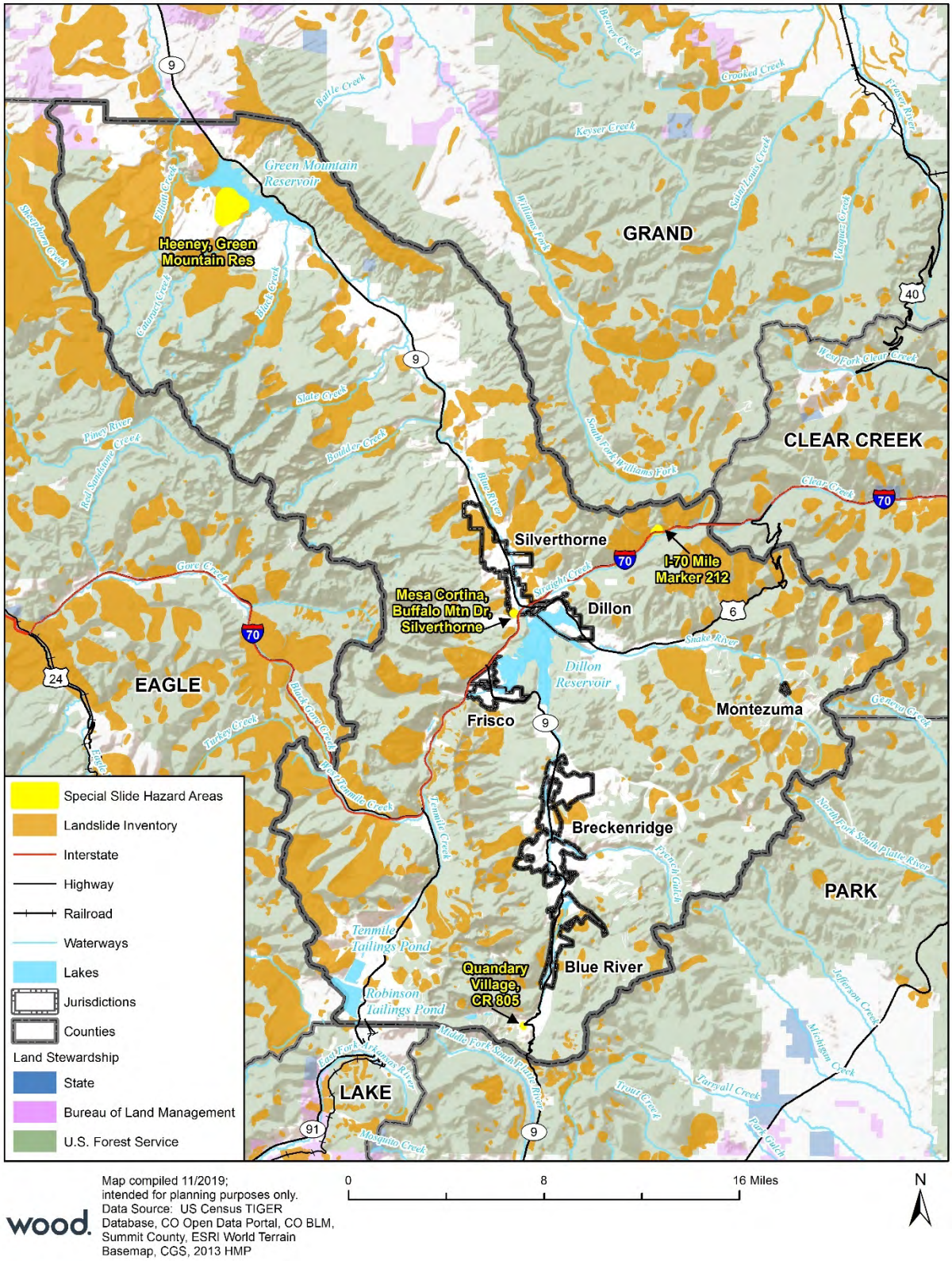
months and diverting traffic over Loveland Pass. Such a closure would be costly to the State's tourism and commerce industry and impact shipping and transit at the national level[1].

Rockfall areas include the Tenmile Canyon corridor of I-70 between Frisco and Copper Mountain and along areas of the Dillon Dam Road, Boreas Pass Road, and portions of the bike path near the High School.

Figure 3-20 illustrates significant landslide hazard areas in Summit County, as determined by the Colorado Geological Survey. The polygons in yellow are special slide hazard areas identified by the county; these are described and analyzed in more detail under Section 3.3.3 Vulnerability by Hazard.

[1] Larry Borowsky, "Braking I-70's Slow Slide." Colorado School of Mines, Mines Magazine, Spring 2013.

Figure 3-19 Summit County Landslide Hazard Areas



Previous Occurrences

Previous occurrences of landslide and related hazards are not always well known unless they cause damages or hurt populations. However, below is a summary of the noteworthy events that were recorded, in chronological order from most recent to oldest, based on sources such as the HMPC.

- **May 9, 2013**—A rockslide believed to have been caused by rain closed the right lane of westbound I-70 west of Frisco for about half an hour. Drivers helped pick up the smaller boulders to clear the roadway, putting themselves at risk of further rockfall and traffic. The HMPC also noted a fatality involving a rock striking a motorist on I-70; the exact timing of the event was unknown.
- **July 6, 2011**—A significant mudslide occurred in the Straight Creek drainage between the 212 and 212.5 mile markers along I-70 on this day. The slide started above treeline and traveled down to a benched ridge above Straight Creek. Mudflows continued over the bench, through the forest, and reached and partially blocked Straight Creek. Sediment muddied the Creek, the primary water supply for Dillon and Dillon Valley. There were also concerns about the possibility of the mudslide completely damming Straight Creek, causing a public safety hazard. The U.S. Forest Service hydrologist who evaluated the incident determined that the mudslide did not pose a significant threat to public safety or water quality. Additional concerns included a nearby power line with an attached fiber optic line and a high pressure gas line located about two hundred yards west of the slide. These issues were checked by the Colorado Department of Transportation (CDOT). CDOT was satisfied that neither the gas line nor the power line was in imminent danger of being damaged. Xcel Energy was also made aware of the potential issues. Backup options were available for both the power line and water supply if the worst had happened. Figure 3-21 shows damages from the mudslide event.
- **June 2011**—A landslide occurred near the Keystone Ski Area in June 2011. A water transmission line had to be replaced. This was the third landslide within a half-mile radius in 17 years.
- **May 24, 2010**—A retaining wall on Little Beaver Trail in Dillon failed and collapsed onto the roadway. The roadway was blocked and closed for four months, though it was later reopened as a one-way road for 12 months. An impacted property owner was forced to delay their business opening for one year due to the slope failure event.
- **1963**—A rapid drawdown of the water in Green Mountain Reservoir caused a landslide that resulted in the loss of several homes in the community of Heeney this year.
- **Date Unknown**—The slump on I-70 at mile marker 212, known as the "Big Bump" and described under the Geographic Location section herein, is a slow and persistent landslide that subsides a few inches each year. The area has been steadily sliding since the 1970s. A catastrophic event has not yet occurred.
- **Date Unknown**—According to the Colorado Natural Hazards Mitigation Plan (2011), an area being planned as a subdivision in Summit County was engulfed by a mudslide caused by saturated soils below the Town of Breckenridge water reservoir and a beaver pond. No structures were involved. Geologic investigation showed several similar slides had occurred previously. The property lost its prime value and extensive regrading and mitigation work was required. It is unknown when this occurred.

Shale fall along Highway 9, in the north part of the county near the Green Mountain Reservoir, has blocked the highway in the past.

Figure 3-20 July 6, 2011 Mudslide and Damages Incurred from the Event

Source: HMPC

Probability of Future Occurrence

Occasional—This hazard has a 1-10% chance of occurrence in the next year, equivalent to a recurrence interval of 1 in 11 to 100 years.

Based on the known past events and the identified areas currently being monitored, probability of damaging landslide events in the future is occasional. Landslide activity typically increases during wet cycles, though drawdown of reservoir levels during drought has caused landslides to re-activate in Summit County.

Magnitude/Severity

Critical—Isolated deaths and/or multiple injuries and illnesses have and can occur; major or long-term property damage that threatens structural stability expected; and/or interruption of essential facilities, infrastructure, and services for 24-72 hours.

Landslides are serious geological hazards that can threaten human life, impact transportation corridors and communication systems, and result in other infrastructure, asset (e.g., reservoirs) and property damage. Actual losses can range from mere inconveniences due to road closures or high maintenance costs where very slow or small-scale destructive slides are involved. Rapidly moving large slides have the capacity to completely destroy buildings, roads, bridges, and other costly human-built structures. Such slides also have the potential for inflicting loss of life when they occur in developed areas. Debris flows and mudslides also have the potential to cause water quality impacts.

The overall significance rating for this hazard is **Medium**.

Climate Change Considerations

Landslides can result from intense rainfall and runoff events. Projected climate change-associated variance in rainfall events may result in more high-intensity events, which could lead to higher frequency in landslide events, especially debris flows. Furthermore, the increased potential of wildfire occurrence due to a warming climate and decreased annual precipitation also escalates the risk of landslide and debris flows in the period following a fire, when slopes lack vegetation to stabilize soils so that burned soil surfaces create more rainfall runoff.

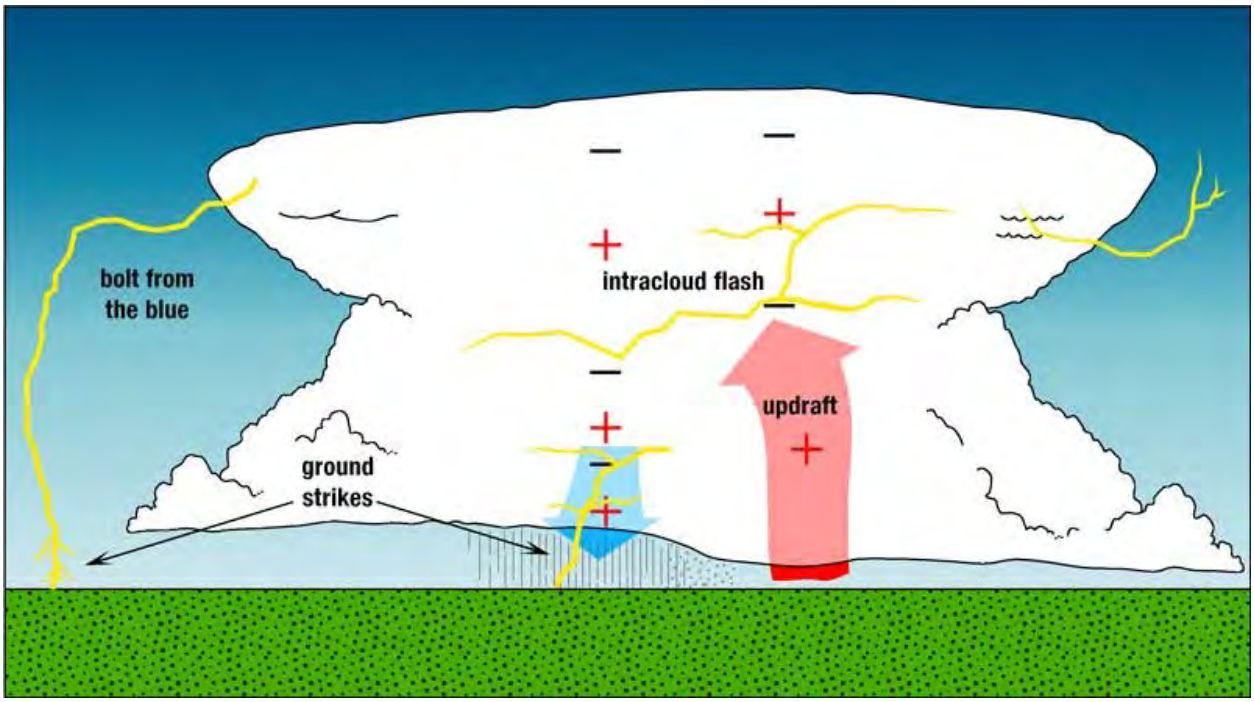
3.2.9 Lightning

Hazard Description

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

Figure 3-21 Cloud to Ground Lighting



Source: National Weather Service Pueblo Office

According to the National Fire Protection Association (NFPA), between 2007 and 2011 local fire departments in the U.S. responded to an average of 22,6000 structural fires per year due to lightning. The National Lightning Safety Institute estimates property damage, increased operating costs, production delays, and lost revenue from lightning and secondary effects to be in excess of $8-10 billion per year. Impacts can be direct or indirect. People or objects can be directly struck, or damage can occur indirectly when the current passes through or near it.

Lighting is the most common cause of wildfires in Summit County (refer to Section 3.2.12 Wildfire). The National Interagency Fire Center reports that each year over 9,941 fire are reported to lightning-caused. On average the Rocky Mountain region has a report of 1,395 lighting-caused fires. On average the number of acres burned due to lightning-caused fires is nine times (402 acres) higher than the average acres burned for human-caused fires (45 acres) (NFPA 2013).

Geographic Location

Extensive - Lightning can occur anywhere in the County.

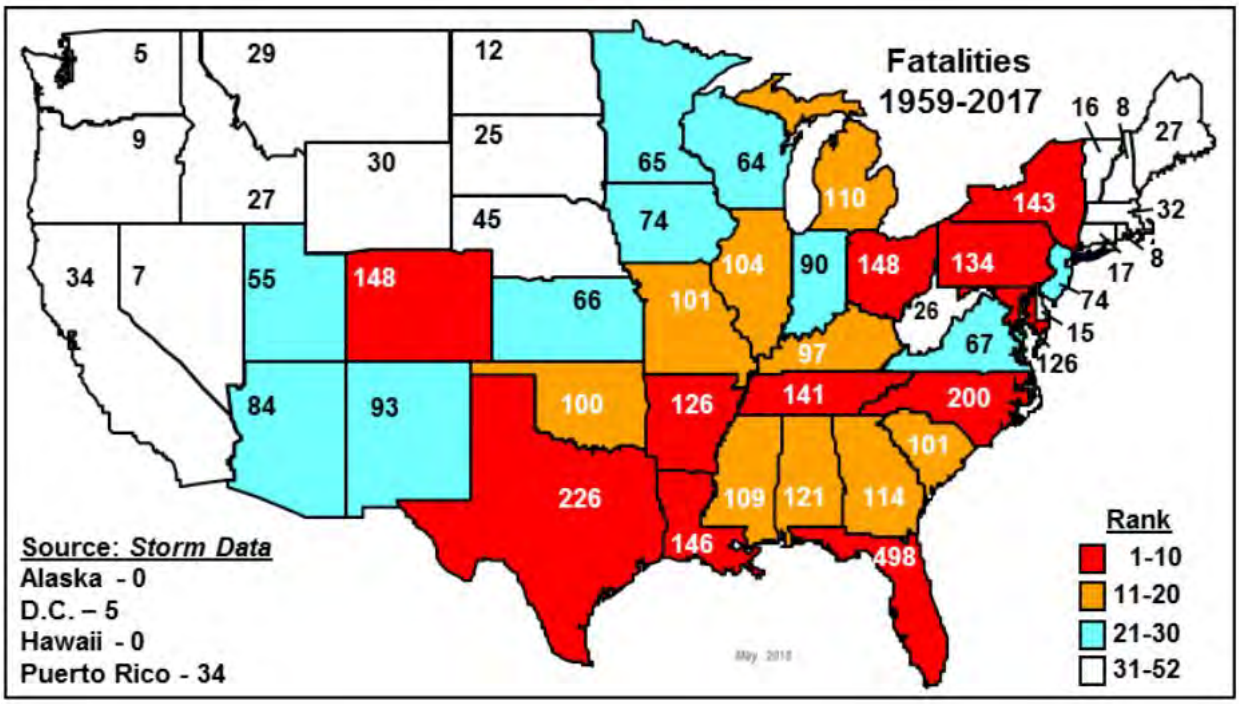
Previous Occurrences

According to the National Weather Service Colorado ranks 19th in the nation with respect to the number of cloud-to-ground lightning flashes with an average number of 490,164 flashes per year (based on data collected between 2008 and 2017). Colorado ranks 31st in terms of cloud-to-ground flash density in the United Sates, with an average 4.7 flashes per kilometer squared (National Weather Service).

Figure 3-23 shows state-by-state lightning deaths between 1959 and 2017. Colorado ranks fourth for the number of deaths at 148. Florida (498), Texas (226), and North Carolina (200) were ranked higher. Based

on National Weather Service data since 1980 an average of 3 people are killed and 12 are injured in Colorado.

Figure 3-22 Lightning Fatalities in the United States, 1959-2017



Source: National Weather Service

While lightning is a regular occurrence in Summit County, damaging lightning is not. According to the NCEI Storm Event Database, there were five notable lightning events in Summit County between 1997 and December 2019; the most recent event in the database is from 2011:

- **July 18, 2011—**Thunderstorms produced very heavy rain and continuous lightning over Summit County. The historic rainstorm in the town of Breckenridge produced 3.17 inches of rain at the local weather station. Most of the rain fell in less than 3 hours. A cooperative observer with the National Weather Service also recorded 3.59 inches of rainfall in east Breckenridge. The highest recorded 24-hour rainfall prior to this event occurred in the early 1890s when 2.6 inches was observed. Nearly 3,900 cloud to ground lightning strikes were also recorded during the 3-hour span. The steeple of the Father Dyer Church in Breckenridge sustained a direct hit from one of those strikes, damaging the historic structure. The heavy rainfall produced a large landslide a few miles above Dillon where a section of treeline collapsed. Large amounts of sediment partially covered a section of Straight Creek, which is the main water supply to thousands in the area. In addition, mudslides closed a portion of State Highway 9 north of Dillon and Airport Road in Breckenridge. Extensive flooding also forced the closure of Breckenridge Golf Course for several days. Damages were estimated at $15,000.
- **July 10, 2011—**Severe thunderstorms produced intense microburst winds over parts of Boulder and Elbert counties. Lightning damaged a boat in Dillon Reservoir. The blast blew several instruments off the top of the boat. All the electronics on the boat were fried, and a one-inch diameter hole was burned in the hull of the boat. Damages were estimated at $5,000.
- **August 1, 2004**—Lightning killed a woman as she was hiking in French Gulch near Breckenridge. Four other people hiking with the woman were knocked down but suffered only minor injuries.

- **July 9, 2001**—Lightning struck a home in Keystone, damaging the roof.
- **June 8, 1997**—Two search and rescue volunteers were injured while rescuing a skier atop Peak 10 at Breckenridge Ski Area. Lightning struck the first man as he was towing the injured skier by snowmobile and toboggan. The bolt struck the snowmobile, then the rescuer, causing the rescuer permanent disability in eyesight. The other rescuer was injured 1/4 mile away. Apparently, the ground current created by the lightning travelled up his ski pole. He suffered temporary dizziness as a result of the strike.

It should be noted that this database captures only small portion of damaging lightning events; most go unreported. The National Weather Service has been tracking lightning casualties by county in Colorado since 1980. The NWS statistics only include lighting causalities through 2018. According to the NWS statistics, Summit County has not experienced a documented causality due to lighting since 2004, refer to Table 3-13. All events took place in the afternoon and were most common in the summer months between June and August. According to the State of Colorado 2018 HMP, in any given day in July or August over 4,000 lightning flashes are expected to occur in Colorado.

Table 3-12 Lightning Fatalities and Injuries in Summit County, 1988-2018

Date	Time	Fatalities	Injury
July 3, 1988	Afternoon	0	2
July 1, 1990	1:00pm	0	5
April 5, 1992	12:55pm	1	2
June 8, 1997	1:45pm	0	2
August 1, 2004	2:30pm	1	2
Total		**2**	**13**

Source: National Weather Service https://www.weather.gov/pub/lightning_casualties_by_county

Probability of Future Occurrence

Likely—10-100% chance of occurrence in next year or has a recurrence interval of 10 years or less

It is likely that lightning will occur every year in Summit County, but not all will be damaging. In the last 31 years, the County experienced eight damaging lightning events. This averages to a damaging lightning event every four years, or roughly a 26 percent chance of an event in any given year.

Magnitude/Severity

Common problems associated with lightning include the loss of utilities and related impacts. Loss of life is uncommon but can occur during severe storms. Loss of utilities, specifically power lines can occur due to downed trees from lighting.

Lightning is measured by the Lightning Activity Level (LAL) scale, created by the National Weather Service to define lightning activity into a specific categorical scale. The LAL is a common parameter that is part of fire weather forecasts nationwide. Due to the high elevation and varied topography of the County, Summit is at risk to experience lightning in any of these categories. The LAL is reproduced in Table 3-14.

Table 3-13 Lightning Activity Level Scale

Lightning Activity Level	
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five-minute period
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a five-minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a five-minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a five-minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag warning.

Source: National Weather Service

Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

Lightning can cause deaths, injuries, and property damage, including damage to buildings, communications systems, power lines, and electrical systems. It also causes forest and brush fires.

Lightning can occur anywhere in Summit County, and it is not possible to identify specific hazard area, though high altitude areas above treeline are particularly exposed. Data was not available to identify specific structures at risk. Data on average annual losses was limited, but based on NCEI records, $20,000 in lightning-related damages occurred between 1997 and 2018. Therefore, Summit County could expect roughly $952 dollars in damages from lightning in any given year. Two deaths and fifteen injuries also resulted from lightning during that time span. One of the most serious risks associated with lightning is its potential to cause wildland fires. This in particular could result in substantial losses for the County. For specific details on loss and vulnerability associated with wildland fires, please see the wildland fire vulnerability discussion.

Climate Change Considerations

Lightning tends to occur with warmer temperatures as heat energy fuels storm clouds. Climate change models are estimating an increase in temperature by the end of the century. A warmer climate will increase the chance of lightning events. A study published in the Journal of Science in November of 2014 showed the possibility of a 12 percent increase of lighting events for every degree of warming. On average the United States experiences 20 million lightning strikes with the possibility of 30 million lightning strikes over the continental U.S. by 2100 (Scientific American 2014).

3.2.10 Pest Infestation (Forest and Aquatic)

Hazard Description

The State of Colorado Hazard Mitigation Plan (2018) defines an infestation as a state of being invaded or overrun by parasites that attack plants, animals or humans. An infestation is the presence of a large number of pest organisms in an area, on the surface of a host, or in soil. Pests are any organism (insects, mammals, birds, parasite/pathogen, fungi, non-native species) that are a threat to other living species in its surrounding environment. Pest infestations can result in the destruction of various natural habitats, impact human health and cause disease and death among native plants, wildlife, and livestock.

Beetle epidemics are a natural part of forest ecosystems in Colorado. Certain factors, such as age of forests, drought, crowding, poor growing conditions, and warm temperatures, can fuel epidemics. While the stressed trees are targeted first, as beetle populations increase, they attack most of the large trees in an outbreak area. During an epidemic, enough beetles can emerge from an infested tree to kill at least two, and possibly more, trees the following year. The direction and spread rate of an infestation is impossible to predict. However, attacked trees usually are adjacent to or near previously killed trees. Once the beetle infests a tree, nothing practical can be done to save it, so prevention is critical. Prevention includes forest management (e.g., creating diversity in age and structure) and treating infested trees to kill developing beetles before they emerge as adults. Discolored foliage is generally the first sign of beetle-caused mortality. Needles on infested trees begin changing color several months to one year after attack, going from green to yellowish green, then sorrel and red to rusty brown. In year two, the needles begin to drop off. In year three to four the remaining needles and smaller limbs drop. Beginning about five years postmortem, the dead stems become increasingly susceptible to rot and blow-down.

The pests that have been identified as a threat to Summit County's forests include the following:

- **Western Balsam Bark Beetle/Root Disease Complex** – This beetle has caused persistent damage to Colorado's high-elevation subalpine fir for several years. The western balsam bark beetle is most commonly found in trees that are weakened from root disease, drought or other damaging factors. Unlike other types of beetles (mountain pine and spruce) tree mortality as a result of the infestation is not uniform across the affected landscape. External evidence of the beetle is difficult to find without the removal of the tree's bark. Fir trees killed by the beetle retain their red needles, the predominate symptom of the beetle, for up to 3 years or more. Despite remaining persistent in Colorado acres affected from the western balsam bark beetle decreased by 50% in 2018 (USFS 2018). The lifecycle is one to two years.
- **Spruce Beetle** – The spruce beetle is native to Colorado and feasts on subalpine Engelmann Spruce as its primary source, although it will infest any spruce species. This beetle is most commonly observed at high elevation spruce forests at more than 9,000 feet. According to the United States Forest Service, the spruce beetle is responsible for the deaths of more spruce trees in North American than any other agent. Signs of a spruce beetle infestation are most visible in summer months. When population levels are low the beetle tends to infest downed trees and populations have been seen to increase quickly following an avalanche or windstorm event. The lifecycle of the spruce beetle is one to three years and are most active during the months of July and August.
- **Western Spruce Budworm** – Colorado's most damaging and widespread forest defoliator for several years. The larvae of this moth feeds in the buds of new shoots of Douglas-fir, true firs and spruce trees. As a result of their feeding, the needles on the trees turn a reddish-brown color. Damage tends to occur from early spring through mid-summer months when they turn into moths.

- **Pine Needle Scale** – The pine needle scale is an invasive species that feeds on the needles of pine species including Douglas Fir, Englemann Spruce, Colorado Blue Spruce and Lodgepole Pines. Insects settle on every surface of the trees needles, taking tree nutrients and leading to premature needles drops. Other impacts include branch dieback and increased susceptibility to other insects or disease or tree death.
- **Douglas-Fir Beetle** – This beetle is known as the "most destructive bark beetle of mature Douglas-fir forests in western North America" (CSFS 2016). Mature Douglas-fir trees are the only host for this beetle species. Generally small groups of trees are infested (groups of 100 or more during major outbreaks). Similar to the spruce beetle, a close relative, wind-thrown and downed trees are ideal habitats for the Douglas-fir beetle.
- **Mountain Pine Beetle** – The mountain pine beetle is native to western North America. The insect develops in and affects primarily pines, such as ponderosa, lodgepole, Scotch, and limber pines, and less commonly bristlecone and piñon pines. Populations have decreased since the previous HMP but continue to be a concern for the forests in Summit County.

Pest infestations and invasive species are not just contained to dry land. Marine invasive species, or Aquatic Nuisance Species (ANS), can take over enclosed water ecosystems, disrupting delicate ecological structure and displacing entire native species. Marine invasive species can also foul pipes of hydroelectrical facilities, water works, and other industrial facilities, impairing facility functions. The quagga and zebra mussels have caused havoc in western waterways including threatening Summit County's reservoirs. Colorado Parks and Wildlife considers the quagga mussel the state's most serious aquatic nuisance species threat.

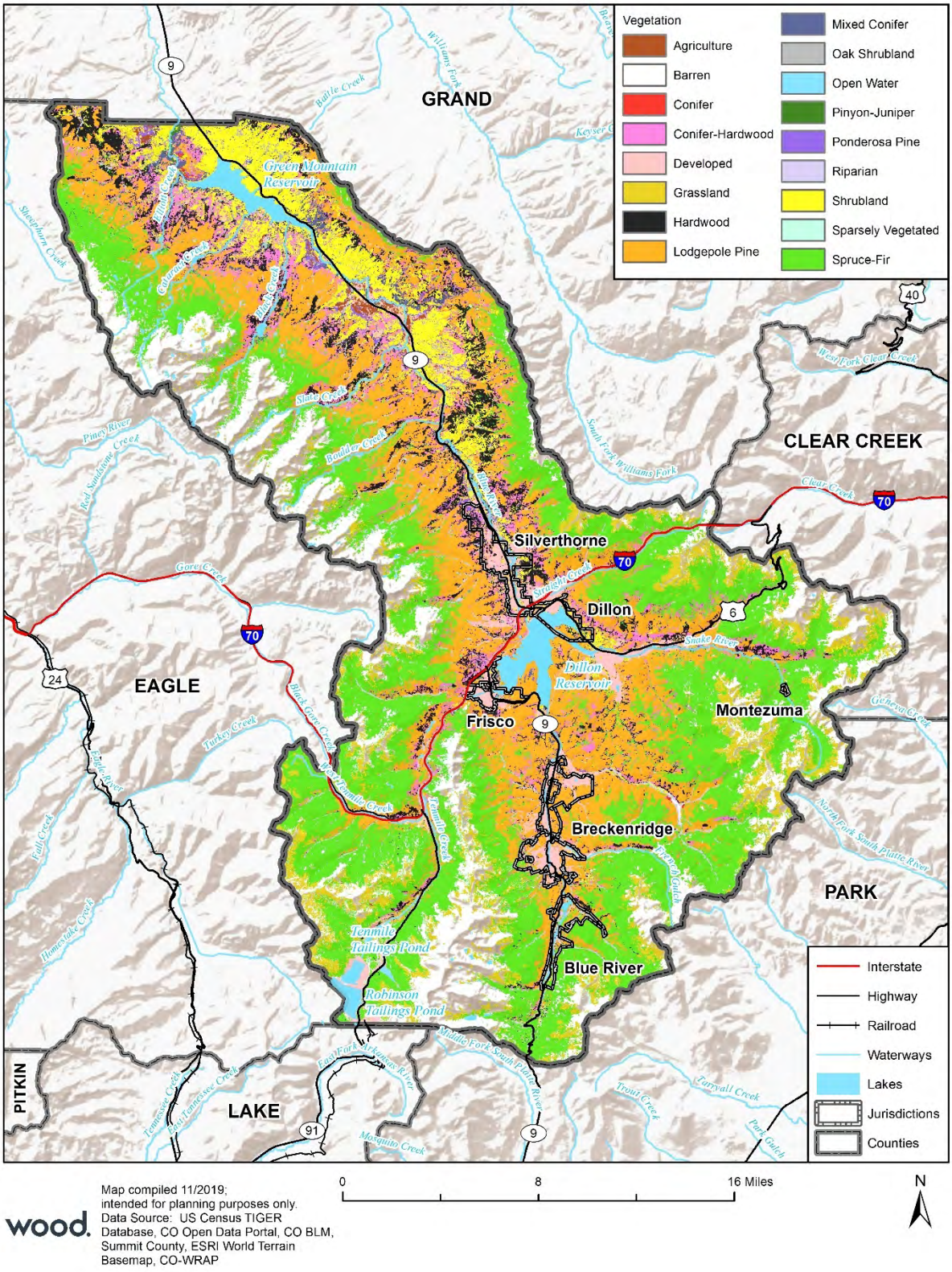
- **Quagga/Zebra Mussels** - Non-native freshwater mussels from eastern Europe that clog waterways, undermine healthy lake ecosystems, ruin boat engine cooling systems, and financially burden water resources agencies. Prolific breeders, these mussels can overrun a lake causing hundreds of thousands of dollars' worth of damage annually. Rapid reproduction can negatively disrupt an ecosystem in a short amount of time. Once these mussels are introduced into a waterway, there is no way to fully eradicate the species.

Geographic Location

Each of the identified beetles above attack a variety of pine, fir and spruce species. In total there are 204,310 forested acres in Summit County of which 118,200 acres are spruce-fir forest (Summit County 2016). Sixty percent of the forested area is lodgepole pine while the remaining forty percent is comprised of aspen and spruce-fir types. The past mountain pine beetle epidemic in Summit County was almost entirely limited to lodgepole pine. The spruce beetle has surpassed the damage of the mountain pine beetle infesting178,000 acres of high-elevation Engelmann spruce forests in 2018 (USFS 2018). Despite a reported decline in pine needle scale in 2018, the U.S. Forest Service reports the beetle continuing to be persistent along the I-70 corridor including being found in Breckenridge. The Douglas-fir beetle has impacted Douglas-fir trees along the Mosquito Range in portions of southern Summit County and neighboring counties.

The following figure shows the vegetation breakdown by type in Summit County.

Figure 3-23 Types of Vegetation in Summit County



Map compiled 11/2019;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CO-WRAP

Aquatic infestations of the zebra and quagga mussels have been found in waterways across the western United States. In Summit County they have been found in the past in the Green Mountain Reservoir and have posed a threat to Dillon Reservoir. Both are multiuse reservoirs opened to recreational activities such as boating. Boating is a leading cause of introducing the invasive mussels into waterways.

Previous Occurrences

At the peak of mountain pine beetle infestation in 2008, over a million acres of Colorado's forests were impacted. By 2012 over three million acres had been infested statewide. In 2012 mountain pine beetle activity in Colorado declined for the fourth consecutive year as food sources became depleted in many areas of the state (at this time 264,000 acres of active infestation were detected). Between 1996 and 2014 the mountain pine beetle affected 3.4 million acres. By 2018, the spruce beetle surpassed the mountain pine beetle as most active threat to Colorado forests. Between 2000 and 2018 the spruce beetle had affected over 1.84 million acres of forests, the Engelmann spruce trees being the main victim of infestations (USFS 2018).

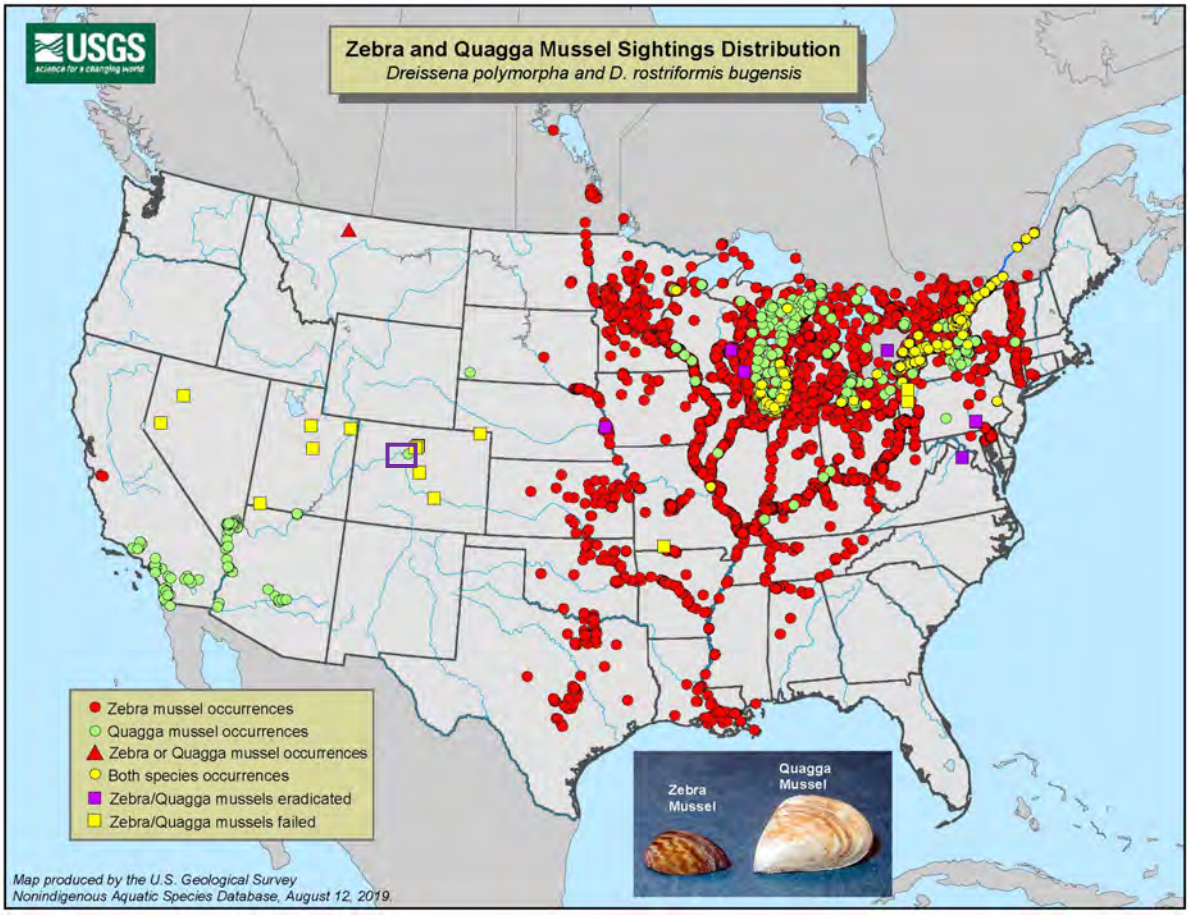
As noted above, outbreaks of the western balsam bark beetle decreased by 50% in 2018 but still continued to pose a threat to Summit County with 2,700 acres affected in 2018 an increase from 1,900 acres in 2017. Similarly, the U.S. Forest Service reported a decline in pine needle scale infestations in 2018 for much of the Colorado High Country but has remained persistent along the I-70 corridor in portions of Summit County. The infestations of forests pests have been on the decline. Based on an aerial survey by the Colorado State Forest Service in 2018, of Summit County's 204,310 forested acres, 82.4 acres or 0.04% of the forest was affected by an active pest infestation.

In August 2017, the quagga mussel was found in the Green Mountain Reservoir after years of being threatened by the invasive species and monitoring of the reservoir. Since 2017, the Reservoir is considered a 'suspect' reservoir for infestation. Between 2008 and 2017, eight total reservoirs in Colorado were confirmed to have mussel's present including the Willow Creek and Shadow Mountain Lake in neighboring Grand County. While the mussels haven't been found in Dillon Reservoir, Denver Water pays for boat inspectors who are trained in identifying aquatic nuisance species to inspect all boats prior to entering the water especially if from out of state. According to the HMPC in addition to boats kayaks are also a concern for infestation. The Green Mountain Reservoir also has inspectors that are funded through a combination of U.S. Forest Service regional funding when available, that is spilt between districts as well as funding from Colorado Parks and Wildlife.

Statewide in 2017 inspectors identified twenty-six boats infested with adult mussels, according to Colorado Parks and Wildlife. This was a new record for the state. Since 2008, Colorado has intercepted a total of 144 boats infested with adult mussels (Colorado Parks and Wildlife 2018).

Figure 3-25 shows the distribution of zebra and quagga mussel sightings across the United States as of August 12, 2019. The general area of Summit County is noted by the purple square.

Figure 3-24 Distribution of Zebra and Quagga Mussel Sightings Across the United States



Source: U.S. Geological Survey

Probability of Future Occurrence

Likely— 10-10% chance of occurrence in the next year or has a recurrence interval of 10 years or less.

Forest beetles are endemic to the area, with outbreaks occurring cyclically. Since lodgepole pine forests are subject to stand replacing fires roughly every 100 to 300 years the species is well adapted to recovering from, and in fact requires, whole scale disturbances (Kaufmann et al 2008). However, the people who visit and live in Summit County are less accustomed to such widespread changes on the landscape. Because it will require decades for mature lodgepole pine stands to become reestablished, there is a low probability that an epidemic of this magnitude will occur again in the twenty-first century.

While probability of future occurrence is usually calculated based on past experience, different invasive pests have different recidivism rates across the county. Based on past experience, invasive species will continue to present a constant threat to the county and its jurisdictions.

Magnitude/Severity

Limited—Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours.

The definitions for magnitude/severity are not well-suited to this hazard. Although the forest beetles are unlikely to cause deaths or injuries or significant damage to property and infrastructures, it is killing millions of trees each year. The following table shows a breakdown of the number of forested acres affected by pest infestation in Summit County between 1996 and 2018.

Table 3-14 Forest Disturbance Due to Pests in Summit County, 1996-2018

Type of Pest	Forest Type and # Of Acres in County	# Of Acres Pest is Present (1996-2018)	% Of Forest Affected (1996-2018)
Western Spruce Budworm	Mixed-Conifer and Spruce forest 120,880 ac	697	0.6%
Douglas-fir Beetle	Mixed-Conifer 2,600 ac	483	18%
Mountain Pine Beetle	Pine 83,400 ac	65,760	79%
Spruce Beetle	Spruce-fir 118,200 ac	1,081	0.9%
Western Balsam Bark Beetle	Spruce-fir 118,200 ac	2,700 (2018 only)	2.3% (2018 only)

Source: "Forest Disturbance in Summit County? – 2018 Forest Health Highlights", Dr. Dan West, Colorado State Forest Service, 2019

The forest mortality resulting a pest epidemic creates a number of direct and indirect hazards:

Deadfall and Blowdown: Approximately five years after mortality, the standing dead trees become markedly susceptible to falling and being blown down. This creates a hazard to lives and property near inhabited areas, travel corridors, and recreation areas. Some species such as the spruce beetle also thrive in blown down trees.

Power line impingement: The hazard to power lines from beetle impact forests merits specific attention. Power lines are dispersed throughout Colorado's forests, and the clearance around these lines is typically inadequate to address the threat of large scale mortality. Contact between power lines and trees has caused several fires in recent years and creates the potential for local power outages. It is noteworthy that a tree impinging on a powerline in California in 2018 caused the Camp Fire, the deadliest and most destructive wildfire in California's history.

Erosion: The loss of the lodgepole pine overstory should not increase erosion in and of itself. Quite unlike the effects of fire, the ground cover provided by duff, forest litter, and the understory remains in place. In fact, the surface litter load increases as needles, limbs, and tree stems fall to the forest floor in the years following mortality. Impacted areas may see an increase in overall water runoff in the absence of the water uptake required by a mature forest (Kaufmann et al 2008).

As lodgepole pine on the lower slopes of ski areas are lost, wind scouring may become more pronounced on ski runs, requiring increased snow fencing and other mitigative efforts to prevent loss of cover.

Hazardous fuels: There is no doubt that forest beetle epidemics greatly increase the amount of dead biomass in the forests, but predictions that this translates into an immediately drastic increase in the fire hazard is an oversimplification. While the infestation phase of the current MPB epidemic has largely run its course in Summit County, the impacts will continue to be felt for years as mortality continues, forests

fall to the ground, and forest regeneration begins anew. As discussed in the Upper Blue River Basin Wildland-Urban Interface Forest Management Plan (Butler and Peterson 2009), moderate load conifer litter (fuel model TL3) can be expected to transition into high load conifer litter (fuel model TL5) as dead fall begins to accumulate approximately 10 years postmortem. As the understory is released and lodgepole pine regenerates, the fuel model is likely to become a very high load of timber and shrub (fuel model TU5) (Green 2007).

These changes in fuel loads will initially increase crown fire potential to some degree, as the needles dry on the trees. Once the needles and limbs begin to drop to the ground, crown fire potential diminishes, while the potential for more intense surface fire grows with the fuel load. Depending on how the new vegetation emerges on individual sites, the potential exists for very intense surface fires through brush and pine saplings until the forests mature. While it is impractical to treat the entirety of the affected area, fuels mitigation projects are being prioritized and undertaken near vulnerable areas as set forth in the Summit County Wildfire Protection Plan.

Aquatic nuisance species can have significant impacts on the natural environment as well as significant financial impacts on communities. Eradicating adult mussels specifically is extremely difficult and nearly impossible once established. Once identified in local waterways, controlling infestations become a permanent and expensive part of normal operations for communities. For example, the Metro District of Southern California will spend an estimated $10 million to $15 million annually in operations and maintenance costs to address quagga mussel infestation in its infrastructure (CPW 2018). The Mussel-Free Colorado Act signed by Governor Hickenlooper in 2018 provided funding source of $2.4 million for the state's ANS program in 2019. The Act requires boats to purchase an ANS stamp, increases fines related to ANS violations, and allows CPW to charge labor/costs incurred to store and decontaminate intercepted vessels (CPW 2018).

Climate Change Considerations

According to the Summit County Climate Action Plan, forests grow slowly in the county due to the altitude, precipitation and colder than average temperatures. The plan states that, "most of Summit County's forests have been storing carbon for over a century" (Summit County 2018). The loss of forests due to pest infestations can have a larger impact on the county including increasing the output of greenhouse gases.

Changing climate conditions are expected to influence future pest infestation events. According to the Fourth National Climate Assessment, climate change is aiding in the spread of invasive species and often the changing climate favors the nonnative invading species over native ones. The State of Colorado Hazard Mitigation Plan (2018) identifies the following projected changes to pest infestations as a result of climate change:

- Pests are projected to expand into more northern and higher elevation regions as average temperatures increase.
- Pest infestations are projected to increase in intensity as average temperatures increase. The intensity and extent of infestations may also increase.
- Pest infestations are projected to increase in frequency due to increased temperatures.

3.2.11 Severe Winter Weather

Hazard Description

Winter weather includes snow, ice, blizzard conditions, and extreme cold. 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. 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 damage can be 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. 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 is most likely to occur in the winter months of December, January, and February.

In 2001, the National Weather Service 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. The National Weather Service will issue a Wind Chill Warning for Summit County when wind and temperature combine to produce wind chill values of -35°F.

The coldest months on average in Summit County are December and January and record minimum temperatures have fallen to -66°F. The average minimum temperatures are 18°F in Dillon and Breckenridge.

Geographic Location

Large – The entire County is susceptible to severe winter weather

The Western Regional Climate Center reports data from weather stations in and around Summit County. The data reported here are from three of the stations: Breckenridge, Dillon, and Green Mountain Dam. Table 3-16 contains winter weather summaries for the three stations and illustrates differences within the County. Figure 3-26 through Figure 3-31 show daily snowfall and temperature averages and extremes.

Table 3-15 Summit County Winter Weather Summaries in Inches[1]

Station	Average Annual Total Snowfall (in.)	Average Snow Depth (in.)	Snowiest Month/Average Snowfall (in)	Highest Monthly Snowfall (in.)	Highest Seasonal Snowfall (in.)	Coldest Recorded Temperature (F)
Breckenridge[1]	163.6	7.0	March/23.6	94.1 Dec. 1983	292.6 1996	-66 3/2/1895
Dillon[2]	126.4	3.0	March/21.7	73.3 Feb. 1936	261.5 1951	-46 12/24/1924
Green Mountain Dam[3]	73.7	3.0	March/13.9	57.5 Jan. 1980	134.6 1979	-46 2/7/1980

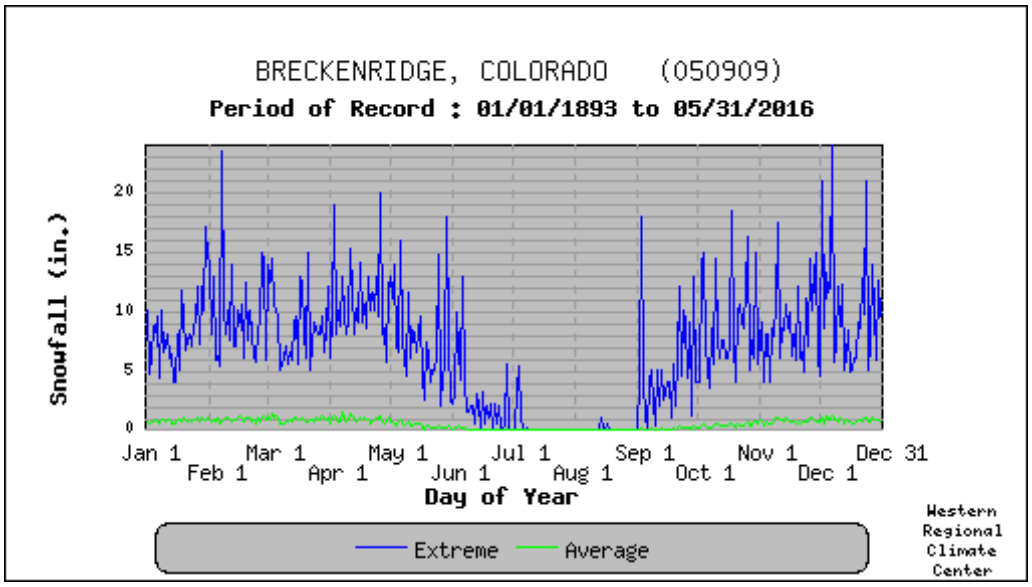
Source: Western Regional Climate Center, www.wrcc.dri.edu/

1 Period of Record 1893 – 2012

2 Period of Record 1893 - 2012

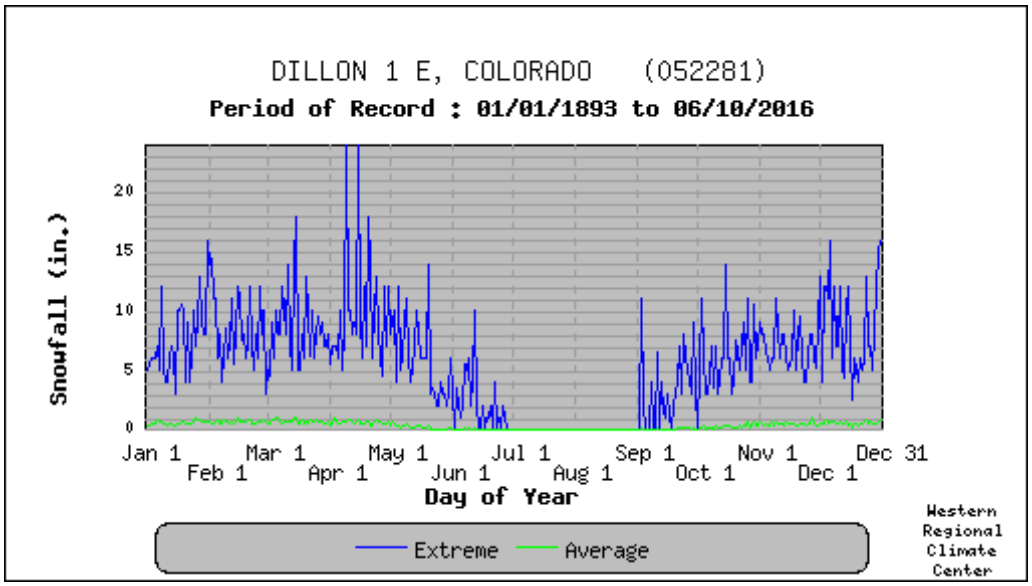
3 Period of Record 1939 - 2012

Figure 3-25 Breckenridge Station Snowfall Averages and Extremes: 1893-2012



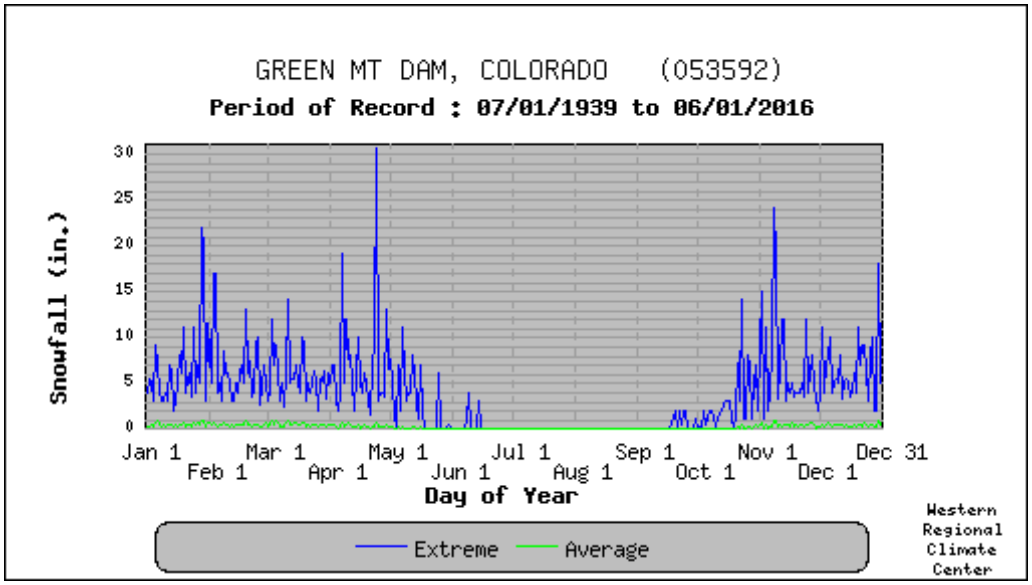
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3-26 Dillon Station Snowfall Averages and Extremes: 1893-2012



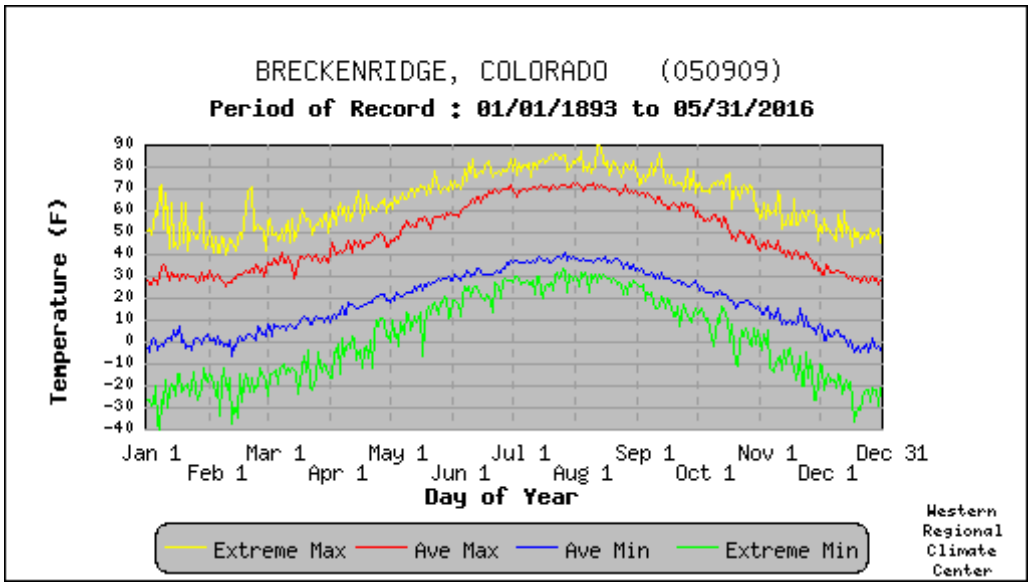
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3-27 Green Mountain Dam Station Snowfall Averages and Extremes: 1939-2012



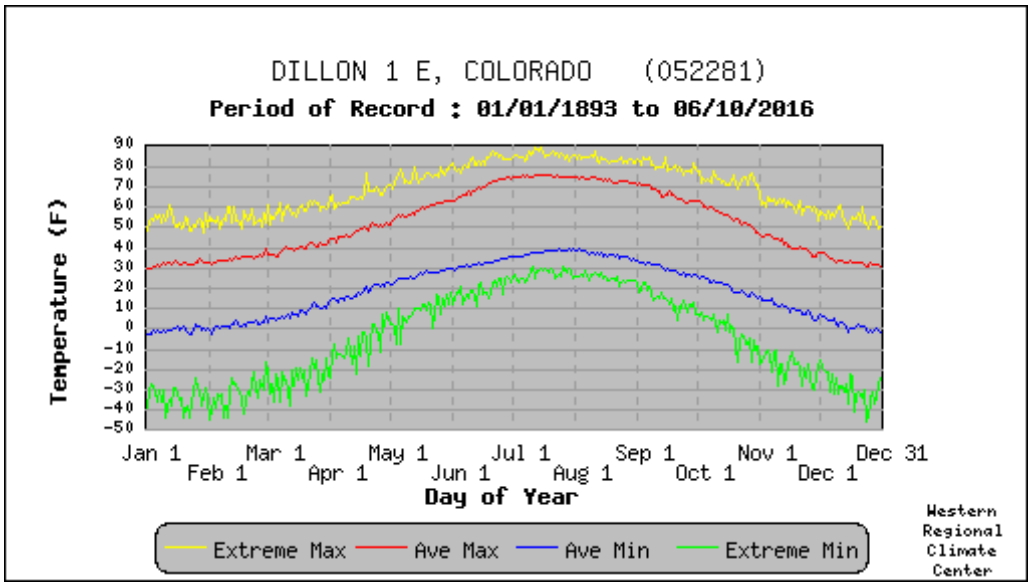
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3-28 Breckenridge Station Temperature Averages and Extremes: 1893-2012



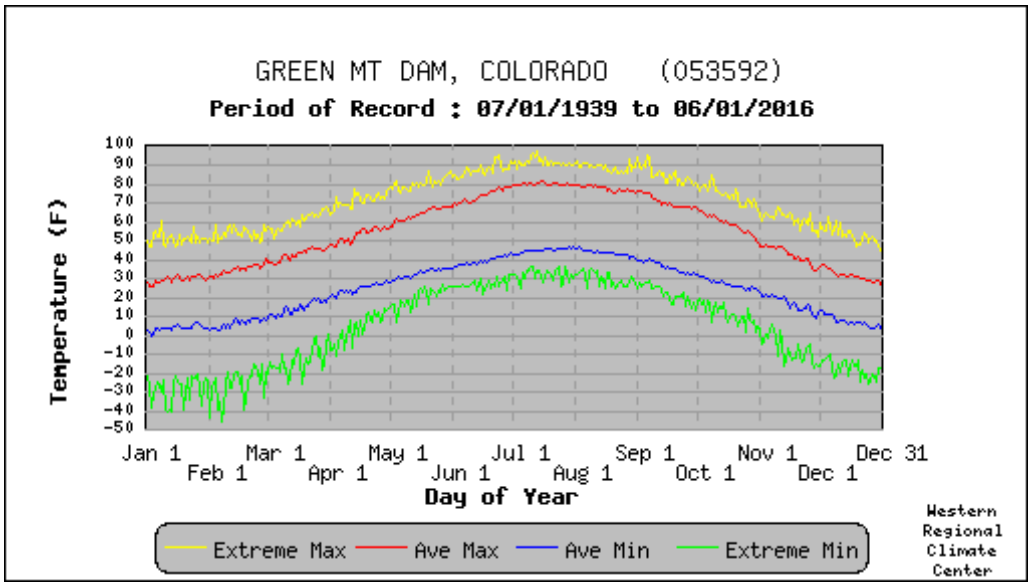
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3-29 Dillon Station Temperature Averages and Extremes: 1893-2012



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3-30 Green Mountain Dam Station Temperature Averages and Extremes: 1939-2012



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Previous Occurrences

Several major winter storms and blizzards have occurred in the planning area over the past several decades. Profiles of some of the more severe storms were obtained from the NCEI Storm Events Database. According to the Database there have been 274 severe winter storm events (includes blizzard, heavy snow, winter storm and winter weather events) between January 1, 1950 and December 31, 2019 that have impacted Summit County. The Storm Events Database does not have any records of deaths, injuries property damage or crop damage due to severe winter storm events, despite this is does not mean that these events did not have any impacts. Descriptions of notable events from the HMPC are included below. There were few significant events in 2011 and 2012, despite increased snowpack totals. This may be attributed to CDOT managing incidents from major winter storms along the I-70 corridor. Since the last plan update, CDOT has been proactively closing I-70 eastbound at Vail; according to the HMPC this has helped in reducing people being stranded in the county while the storm abates. The following are a list of significant events recorded in the Storm Events Database.

- **March 6, 2019 -** A prolonged period of heavy snowfall during the first week of March produced historic avalanche conditions across the northern and central mountains of Colorado. Mountain highways including a large section of I-70 was closed on the 7th due to high to extreme avalanche danger. The snow was heaviest during the overnight hours when a concentrated band of heavy snow remained stationary over a large stretch of the Interstate 70 corridor, producing snowfall rates up to 2 inches per hour. Storm totals included: 17 inches near Loveland Pass; 15 inches near Silverthorne; 11 inches near Frisco; with 6 to 10 inches elsewhere. An avalanche that ruptured a natural gas line behind the Conoco station at Copper Mountain; and several other avalanches led to the closure of I-70 in both directions between Copper Mountain and Vail. The ruptured gas line created a power outage at the Eisenhower Tunnel. Colorado Department of Transportation (CDOT) crews were escorting 100 vehicles through the tunnel when the outage occurred. Interstate 70 between Silverthorne and Empire Junction was closed for about three hours in the area for avalanche mitigation. The Colorado

Avalanche Information Center deemed several of the backcountry zones EXTREME (5 of 5), including Vail and Summit County. This was the first time this designation has been used since they converted to a ten-zone forecast format back in 2006. The warning comes after multiple avalanches over the previous weekend and an avalanche that has shut down Interstate 70 between Frisco and Vail early on the morning of the 7th. *(Refer to the Avalanche section for additional information on previous occurrences of avalanche events)*

- **March 1, 2019 -** A strong westerly flow aloft ushered a prolonged period of heavy snow and strong winds into the north central mountains of Colorado. The combination of snow and wind resulted in a high avalanche danger. An avalanche occurred along Interstate 70 between Frisco and Copper Mountain late in the afternoon on the 3rd. Several vehicles were trapped by the snow as it swept across the interstate. Another avalanche occurred near the same area earlier in the day. No injuries were reported, and the vehicles were able to pull out of the snow field. A large stretch of I-70 was closed through the mountains. On the 5th, both directions of Interstate 70 between Herman Gulch and Silverthorne were closed for 9 hours for avalanche mitigation work. One of the avalanches brought down more snow than expected and covered the westbound lanes with 15 feet of snow and the eastbound lanes with 8 feet. Storm totals for the 3-day event included: 27.5 inches near Hoosier Pass, Longs Peak, Loveland Pass; 26 inches near Berthoud Falls, Climax, Glendevey and Silverthorne; 25.5 inches near Frisco.
- **November 22, 2018 -** Heavy mountain snow developed in the northern mountains over the Thanksgiving weekend, impacting the Interstate 70 corridor the most on the 23rd and 24th. Significant travel impacts occurred due to the adverse conditions and multiple accidents. Both east and westbound lanes at Loveland Pass were closed due to adverse conditions on the 23rd. Several multi-car crashes forced the closure of the I-70 west of the Eisenhower-Johnson Memorial Tunnels on the 24th. Two emergency shelters for motorists were opened in Summit County, where 80 people sought refuge. Storm totals included: 21 inches near Loveland Pass and 13 inches near Copper Mountain.
- **December 23, 2017 -** A powerful jet stream produced considerable snow and blowing snow in the northern Colorado mountains. Storm totals ranged from 6 to 12 inches. Strong winds with gusts ranging from 60 to 80 mph above timberline produced blowing and drifting snow, icy conditions with near zero visibility. The extreme weather conditions, numerous accidents and busy holiday travel forced the extended closure of Interstate 70 in both directions approaching the Eisenhower/Johnson Tunnel. Westbound I-70 was closed from Morrison Road to the tunnel and eastbound was closed at Vail, and from the Silverthorne exit to the tunnel. The closures started late in the afternoon of the 23rd and did not re-open until the following morning. According to CDOT, the Eisenhower Johnson Memorial Tunnel also lost power. Consequently, there was no control over the lights on the highway or the digital message boards. Temporary shelters had to be opened for stranded travelers.
- **April 5, 2016 –** Bands of moderate to heavy snowfall coupled with strong winds produced very poor road conditions along Interstate 70 near the Eisenhower Tunnel. Multiple crashes and poor visibility made travel difficult along stretches of Interstate 70 during the afternoon, forcing closures in several places. Eastbound I-70 was closed from Silverthorne to the Eisenhower Tunnel due to multiple crashes. Crashes also shut down westbound I-70 from Georgetown to the Eisenhower Tunnel. In addition, US-6 at Loveland Pass was closed due to an avalanche hazard. Storm totals during the day ranged from 3 to 6 inches in Summit County. Peak wind gusts included: 84 mph atop Peak 8 at Breckenridge Ski Area, and 62 mph atop Loveland Pass.
- **December 21, 2014 -** A winter storm produced heavy snow and very strong winds in the mountains of northern Colorado. Peak wind gusts to nearly 100 mph were recorded above timberline atop Loveland Pass. In addition, storm totals exceeded 2 feet in some locations. In the mountains, storm totals included: 22 inches near Breckenridge; 20 inches near Copper Mountain; 16 inches near

Loveland Pass; 14 inches, 5 miles south-southwest of Blue River; Peak wind gusts included: 98 mph atop Loveland Pass and 79 mph at Breckenridge Ski Area.

- **January 29, 2014 -** A strong upper level jet stream coupled with abundant moisture from the Pacific brought an extended period of heavy snow to the North Central Mountains of Colorado where enhanced banded snowfall allowed storm totals to exceed 2 feet over a 3-day period. Storm totals included: 32.5 inches, 2 miles south-southeast of Breckenridge; 25.5 inches at Fremont Pass, 19 inches, 9 miles east-northeast of Dillon; 18 inches at Copper Mountain, 16 inches, 1 mile east of Dillon and 7 miles south-southwest of Frisco.
- **November 16, 2013 -** A storm system brought snow and strong winds to the high country. Storm totals generally ranged from 4 to 8 inches. Strong winds were also recorded above timberline. Peak wind gusts included 74 mph at Loveland Pass, with a gust to 72 mph at Copper Mountain.
- **April 13, 2013 -** A spring snowstorm brought heavy snow to the north central mountains of Colorado. Storm totals included: 12 inches at Breckenridge, 11 inches at Silverthorne; 10 inches at the Columbine and Copper Mountain SNOTELs; 9.5 inches at Frisco; 9 inches, 7 miles northwest of Silverthorne; and 8 inches in Dillon.
- **February 23, 2012—**I-70 was closed for adverse weather conditions along the interstate corridor. The closure extended from 4:30am until approximately noon. Avalanche control work was required on Vail Pass.
- **October 2010—**A significant winter storm moved into the area. This event was also marked by high winds. The event caused power outages due trees and branches falling into power lines from the winds. This is also related to the mountain pine beetle infestation causing the deaths of thousands of lodge pole pine trees and making them more susceptible to falling in high winds.
- **April 17-18, 2009—**A spring snowstorm on April 17-18, 2009 occurred as a result of a powerful storm front that moved through the Rocky Mountains and Front Range area, causing the closure of I-70 from mile marker 180 all the way to mile marker 295. Travelers who stopped in Summit County were able to find lodging. No shelters needed to be opened. The significant problem occurred in Clear Creek when CDOT and CSP made the decision to direct hundreds of travelers on the interstate in the east bound lanes to continue traveling through the Eisenhower Tunnel and into Clear Creek. This decision resulted in Clear Creek County declaring an emergency because of the limited number of lodging facilities.
- **December 30, 2007**—More than 2,100 travelers required sheltering when high winds and blowing snow forced the closure of I-70 in both directions. Driving conditions were treacherous and the danger of avalanches was high. Needs exceeded capacity, so the County coordinated with churches to accommodate the overflow. It was the County's largest shelter mobilization to date. The fact that the storm hit on a Sunday over a holiday weekend and came with little warning contributed to the problems. Cellular phones jammed communication networks, which affected emergency communications capabilities. Storm-related traffic accidents included a multi-car pileup on I-70 near Silverthorne.

The HMPC noted that in addition to heavy snow freezing temperatures have also been an issue in the planning area. During winter 2018 power outages during freezing temperatures led to power outages and water line breaks.

Probability of Future Occurrence

Highly Likely—Near 100% chance of occurrence in next year or has a recurrence interval of 10 years or less.

There were 274 recorded winter weather events in Summit County between 1950 and 2019. On average, there are 4 severe winter weather events in the County each year, which equals over 100% chance of occurrence in each year.

Magnitude/Severity

Critical—Multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

Winter weather in Summit County, including strong winds and blizzard conditions, can result in property damage, localized power and phone outages, and closures of streets, highways, schools, businesses, and nonessential government operations. People can also become isolated from essential services in their homes and vehicles. A winter storm can escalate, creating life threatening situations when emergency response is limited by severe winter conditions. Other issues associated with severe winter weather include hypothermia and the threat of physical overexertion that may lead to heart attacks or strokes. Snow removal costs can impact budgets significantly. Heavy snowfall during winter can also lead to flooding or landslides during the spring if the area snowpack melts too quickly. High snow loads also cause damage to buildings and roofs.

Summit County can be isolated on all sides by highway closures or blocked vehicles stopped on the interstate for miles. The County usually has about three days' worth of commodities (food and gasoline). This supply is based upon the needs of a community of nearly 28,000 and is quickly depleted during peak tourism periods when the average daily population is over 100,000. During the December 2007 winter storm event stores already in short supply from the weekend were quickly emptied in one day from 2,500 stranded motorists.

Climate Change Considerations

Climate change has the potential to exacerbate the severity and intensity of winter storms, including potential heavy amounts of snow. A warming climate may also result in warmer winters, the benefits of which may include lower winter heating demand, less cold stress on humans and animals, and a longer growing season. However, these benefits are expected to be offset by the negative consequences of warmer summer temperatures.

The effects of climate change in Colorado have already been observed. The following climate change observations are noted in the 2018 Colorado State Hazard Mitigation Plan:

- Snowpack, as measured by April 1, 2018 snow-water equivalent (SWE), has been mainly below average since 2000 in all of Colorado's river basins, but long-term (30-year, 50-year) declining trends have been detected.
- The timing of snowmelt and peak runoff has shifted earlier in the spring by 1 to 4 weeks across the state's river basins over the past 30 years, due to the combination of lower SWE since 2000, the warning trend in spring temperatures, and enhanced solar absorption from dust-on-snow.

According to the 2018 Summit County Climate Action Plan the following impacts have already been felt by local ski industry:

- Higher night-time temperatures leading to delays in early season snowmaking.
- Compared to the late 1970s, the end of season snow is melting 15 to 30 days earlier, cutting the ski season short.
- Springtime snowpack levels have decreased at most monitoring sites since 1955.

- The reduction of skiers and winter tourists due to decreased snowpack could drastically affect local economy and lifestyle.

3.2.12 Wildfire

Hazard Description

Wildland fire is a naturally occurring disturbance across the landscape of the western United States. While the vegetative communities in Summit County are for the most part adapted to this natural force, many human communities are not. The Wildland-Urban Interface (WUI) is the convergence of these two communities and is defined in the Summit County Community Wildfire Protection Plan (CWPP), re-adopted in 2018, as forested areas within town boundaries, including an area extending 0.5 mile beyond town boundaries. These WUI areas take into account significant developments in unincorporated Summit County. The CWPP further details wildfire hazards, vulnerabilities, and management strategies.

The degree of hazard posed by wildfire is largely a function of the potential fire behavior. Fire behavior is the manner in which a fire reacts to the influences of fuel, weather, and topography. A low intensity, slow moving surface fire is obviously less hazardous to human communities than a rapidly moving crown fire. Fire behavior may be classified as ground fires smoldering in duff and roots, surface fire burning in the forest litter (e.g. grass and low shrubs), or crown fires. Crown fires move through the canopy of trees or shrubs and can be further categorized into active or passive. A passive crown fire, often called "torching", ignites individual or small groups of trees. An active crown fire spreads through the forest canopy as a flaming front. High intensity surface fires and crown fires pose the greatest challenge to suppression resources and the greatest threat to community values.

Generally, there are three major factors that sustain wildfires and predict a given area's potential to burn. These factors are fuel, topography, and weather, described herein.

- **Fuel**—Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume and categorized via fire behavior fuel models. Fuel sources are diverse and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Other fuel sources that need to be taken into account include built structures such as homes and associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for fire spread. In addition, "ladder fuels" can spread a ground fire up through brush and into trees, leading to a devastating crown fire that burns in the upper canopy and cannot be controlled. The volume of available fuel is described in terms of fuel loading.
- **Topography**—An area's terrain affects its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The distribution and types of vegetation on a hillside can also contribute to increased fire activity on slopes.
- **Weather**—Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater the wind, the faster a fire will spread and the more intense it will be. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, which often occur in terrain that is difficult for firefighters to reach.

Drought conditions contribute to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases, and water sources may be scarcer.

Wildfires pose significant concerns throughout Colorado. According to the Colorado State Forest Service, vegetation fires occur on an annual basis; most are controlled and contained early with limited damage. For those ignitions that are not readily contained and become wildfires, damage can be extensive. There are many causes of wildfire, from naturally caused lightning fires to human-caused fires linked to activities such as smoking, campfires, equipment use, and arson.

According to the State of Colorado Multi-Hazard Mitigation Plan, a century of aggressive fire suppression combined with cycles of drought, changing land management practices, and the increase in beetle and other pest infestation occurrences (which affect the lifecycle of vegetation and tree survival in areas like Summit County) has significantly changed the face of Colorado forests. Further, the threat of wildfire and potential losses are generally on the rise as human development and population increases and the wildland-urban interface expands.

Geographic Location

The geographic extent of this hazard in Summit County is **large**, with over 50 % of the planning area having a potential to be affected.

With almost 80% of the County's over 396,000 acres under United States Forest Service (USFS) management, the vast majority of the county will remain in an undeveloped condition that is susceptible, and largely adapted to, periodic wildfire. With Summit County's population on the rise, having already grown 10.8% from 2010 to 2018 and being predicted to grow another 12.5% on average by 2030 (Summit County Planning, 2019), the WUI within this planning area continues to expand dramatically.

The Summit County Community Wildfire Protection Plan utilized a comprehensive analysis to prioritize areas requiring fire protection. These geographic ratings are based on fuel hazard, risk of fire, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capabilities. A map that shows the result of this combined analysis portraying wildfire protection assessment areas and fire threat ranks is shown below (Figure 3-32). Within the risk areas, the plan identified "fire focus areas" for specific project planning and mitigation efforts. These focus areas are considered the highest risk areas and are shown on the map below enclosed in purple polygons.

Table 3-17 summarizes the total acreage and percentage of jurisdictions falling in the wildfire protection assessment rated areas, as displayed in Figure 3-32.

Figure 3-31 Wildfire Protection Assessment Areas and Fire Threat Ratings in Summit County

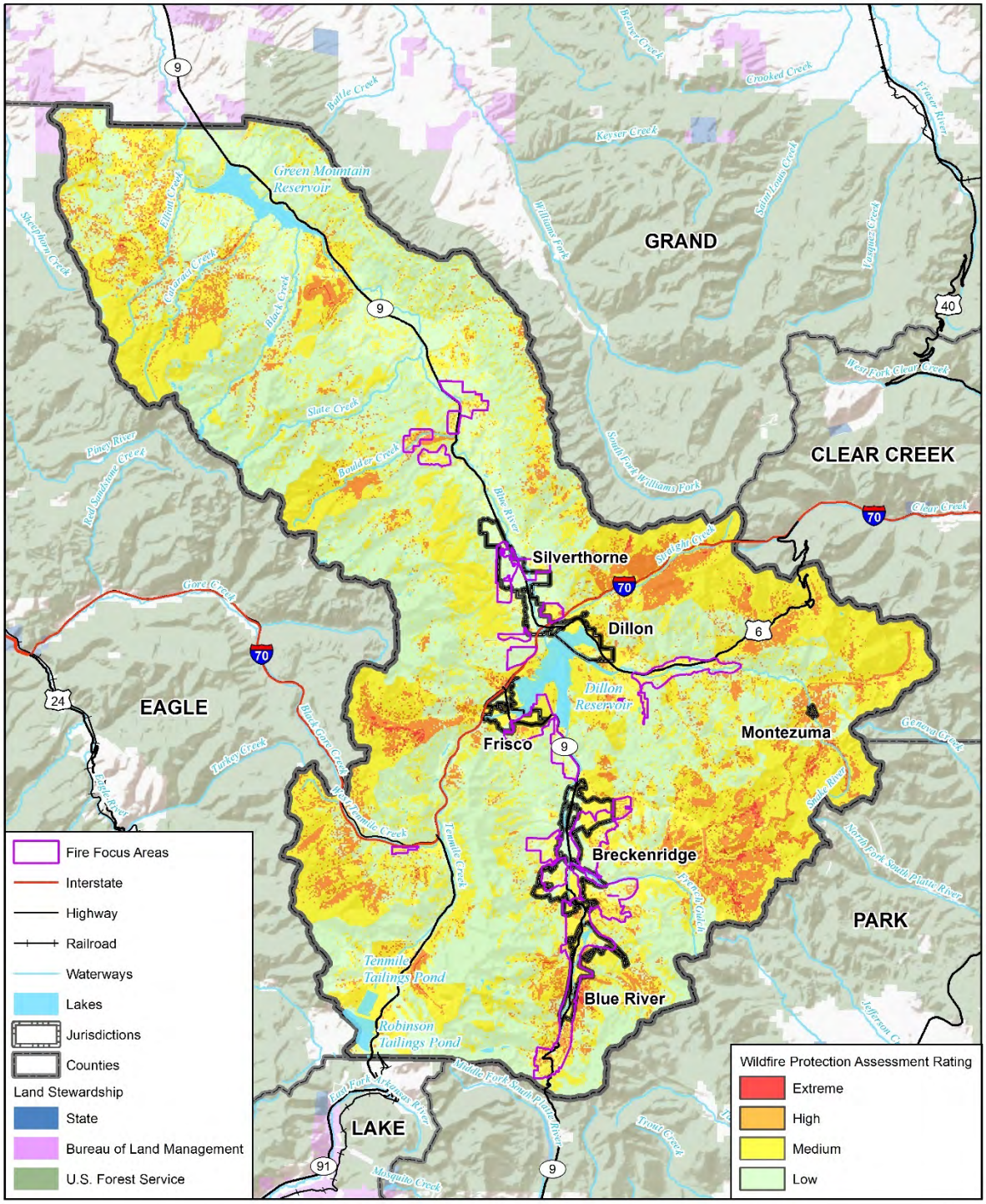


Table 3-16 Acreage in Wildfire Protection Assessment Areas (Threat Zones) by Jurisdiction

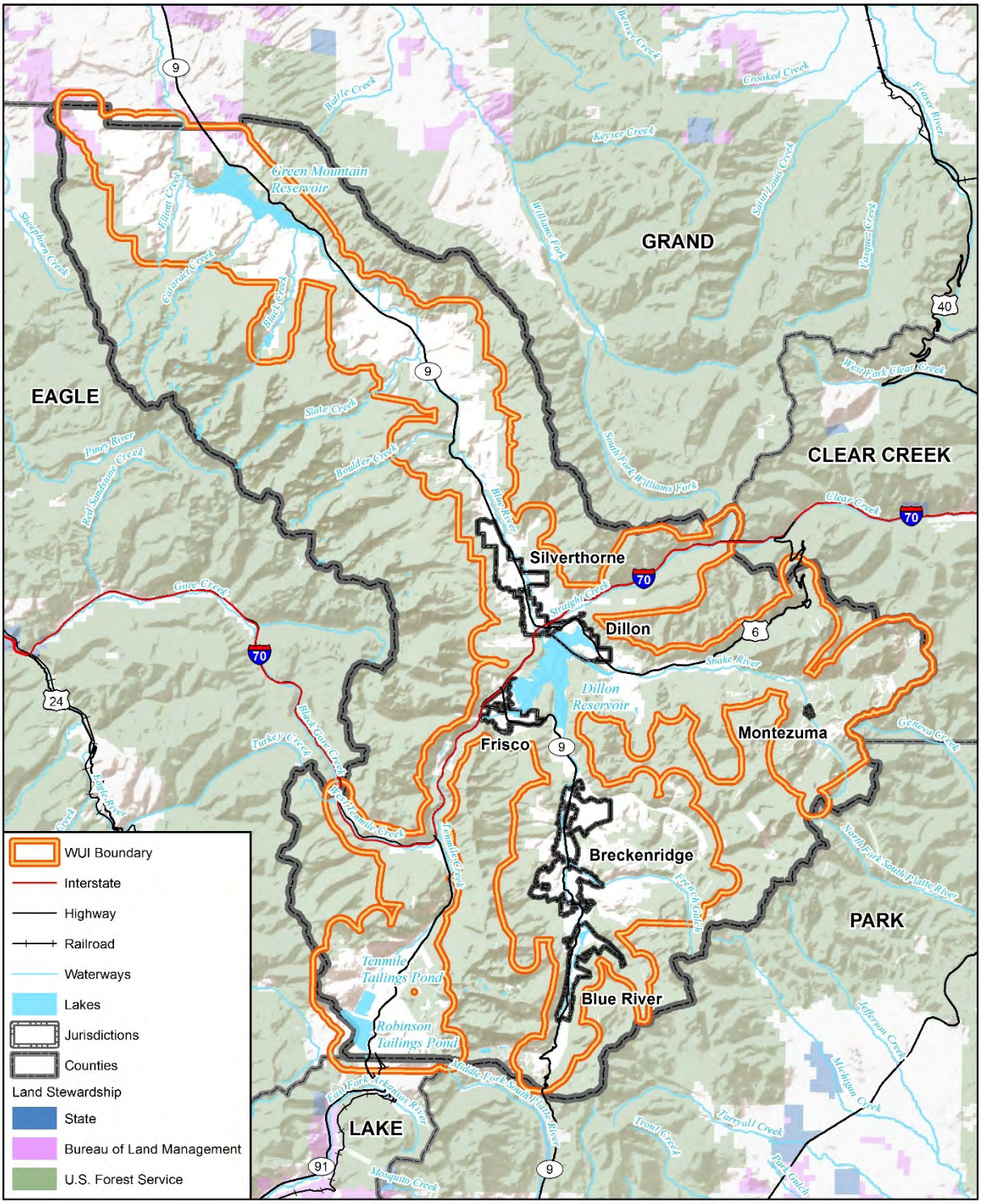
Jurisdiction	Low	% of Total	Medium	% of Total	High	% of Total	Extreme	% of Total	Total Acres
Blue River	265	16%	1,156	71%	182	11%	20	1%	1,622
Breckenridge	1,755	46%	2,024	52%	73	2%	3	0%	3,855
Dillon	181	12%	1,196	81%	105	7%	0	0%	1,483
Frisco	324	29%	776	68%	33	3%	0	0%	1,132
Montezuma	0	1%	31	61%	17	34%	2	4%	50
Silverthorne	2,291	88%	293	11%	10	0%	--	--	2,594
TOTAL	**4,816**	**44.9%**	**5,476**	**51%**	**420**	**3.9%**	**25**	**0.2%**	**10,737**

Source: Summit County, CO-WRAP, Wood Analysis

Based on the information presented in this previous table, which only notes the incorporated jurisdictions in comparison to one another with regards to the wildfire threat areas, Silverthorne and Breckenridge have the most acreage at risk to wildfire, given their overall larger size and hence acreage. Silverthorne has 88% of its acreage at risk of the Low wildfire assessment area, 11% in the medium threat area, less than 1% in the High and Extreme areas combined. Breckenridge, however, has 46% in the Low category, 52% in the Medium areas, 2% in the High areas, and 0.1% in the Extreme category. Montezuma is the jurisdiction with the highest amount of acreage in the High and Extreme categories, nevertheless, with 34% and 4%, respectively. The unincorporated portions of the county contain the largest amounts of at-risk areas. This includes areas that are covered by the fire protection districts.

Figure 3-33 illustrates Summit County's wildland-urban interface which includes forested areas within town boundaries, extends 0.5 miles beyond town boundaries, and includes significant developments in unincorporated Summit County (Summit County Community Wildfire Protection Plan 2018). For more details on the specific housing density percentages within the WUI boundaries, refer to the Summit County CWPP document.

Figure 3-32 Summit County Wildland-Urban Interface (WUI) Boundary



Previous Occurrences

Wildland fire occurrence has been historically focused around the most populated areas in the center of the county, as portrayed in the wildfire occurrence density map in Figure 3-34. The majority of Summit County's wildfires since 1980 have remained smaller than a quarter of an acre. Most fires between a quarter acre and ten acres have been concentrated in the same areas around the I-70, Highway 6, and the Colorado State Highway 9 corridors over the years (see the fire occurrences in the county from Figure 3-34). Since the year 2000, only Brush Creek Fire in 2015 and the Peak 2 Fire in 2017 have exceeded 100 acres. The 2017 Peak 2 Fire led to a governor-declared disaster emergency, which was signed on July 19th of that year, under Executive Order D-2017-018. It authorized deployment of the Colorado National Guard in order to assist Summit County and its communities with fire suppression, evacuations, and general alerting/response operations. Smaller fires of over 10 acres but less than 100 burned acres have taken place throughout the county, as summarized in Table 3-18 below.

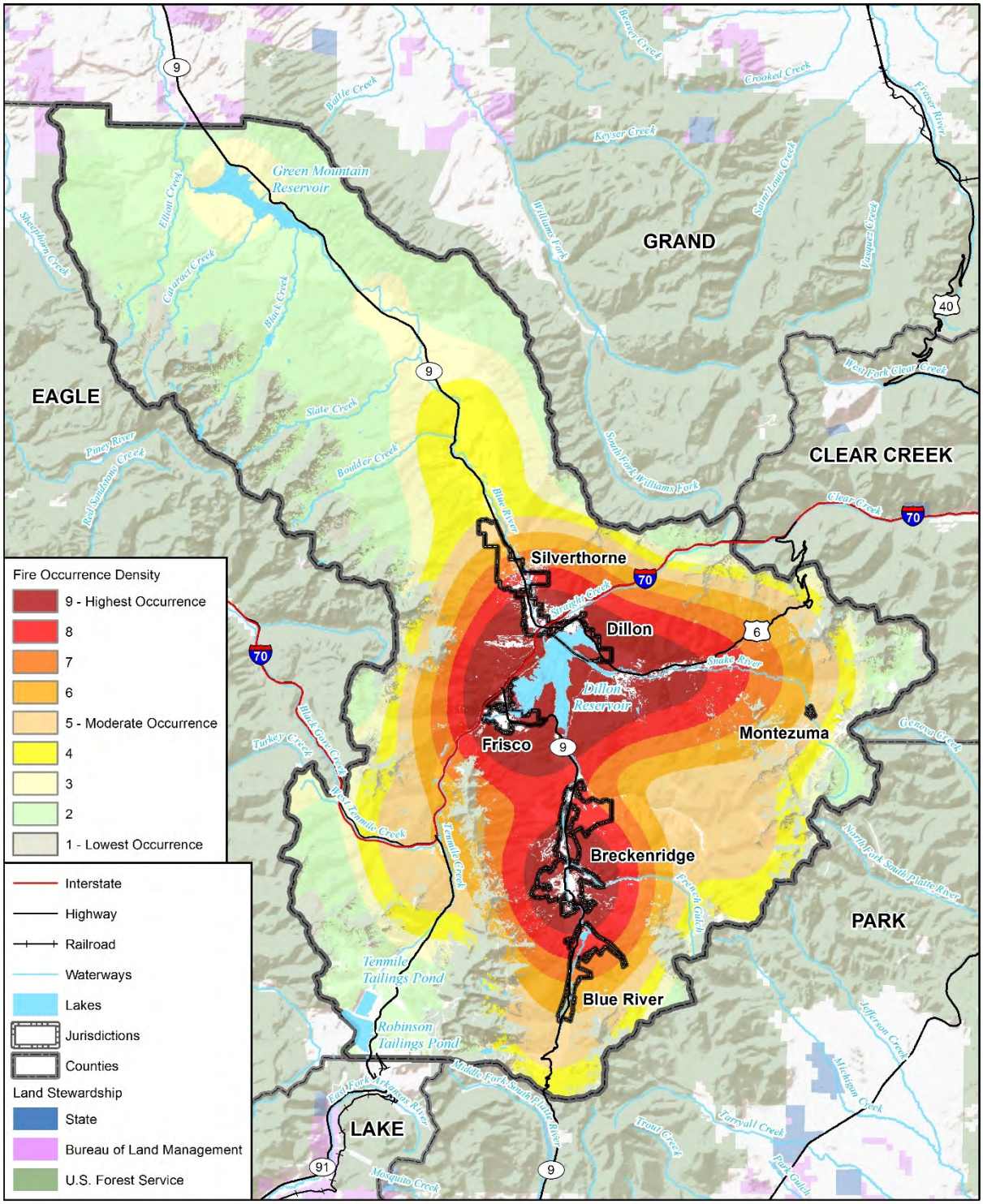
While there is no recent history of larger fires beyond 240 acres, the potential impact of wildland fires in Summit County should not be underestimated. In addition, many areas in Colorado and across the west are beginning to see fires of unprecedented size and intensity, especially given recent development trends, multi-year droughts, and human activity in wildland areas.

Table 3-17 Summit County Recent Fire History

Year of Occurrence	Fire Name	Fire Cause	Acres Burned
2005	Ophir Mountain	Human	16
2011	Gulch	Human	17
2015	Brush Creek	Natural	239
2017	Peak 2	Unknown	142
2017	Tenderfoot 2	Unknown	20
2018	Buffalo	Unknown	82
TOTAL			516

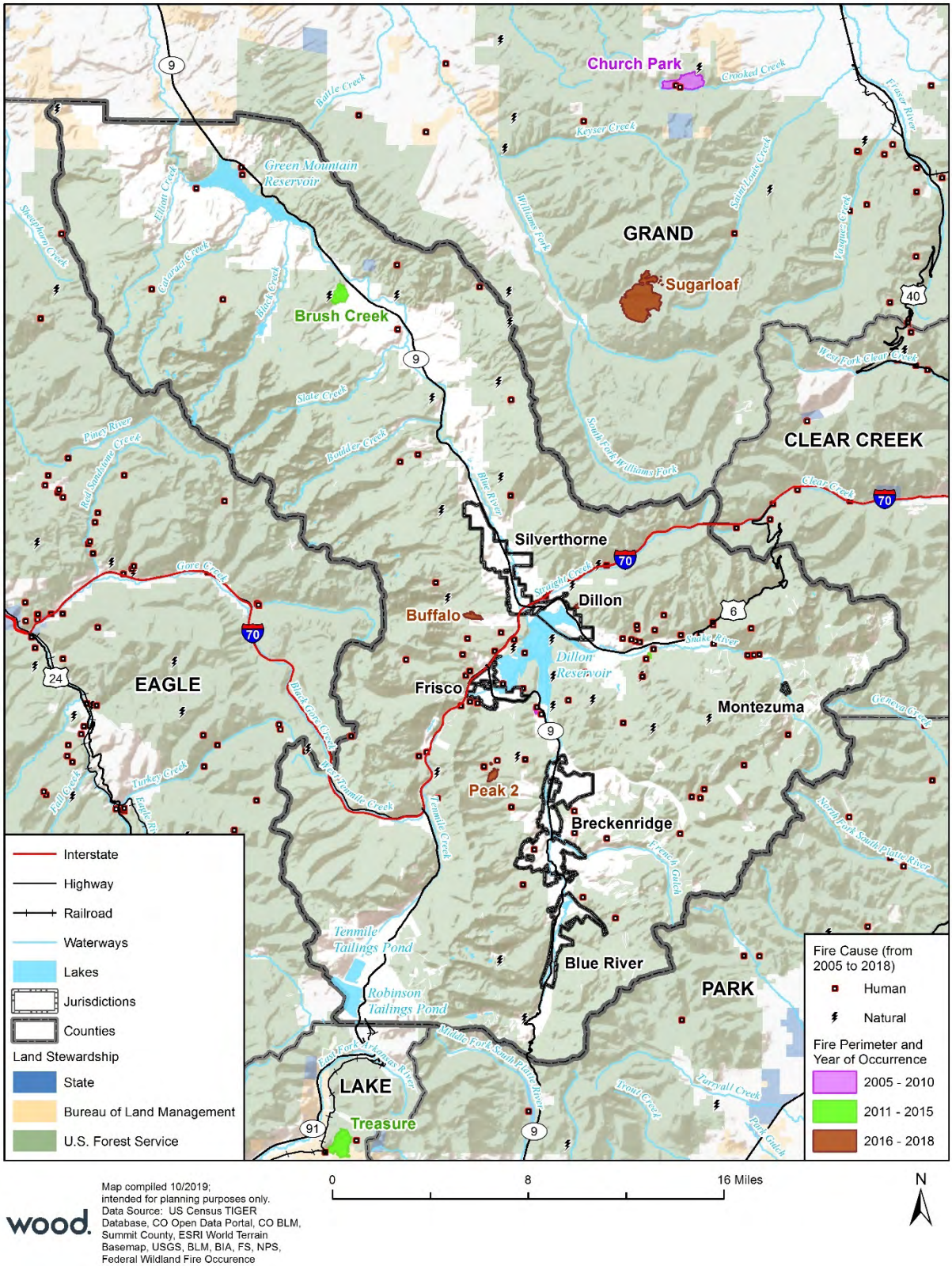
Source: GeoMAC/Federal Wildland Fire Occurrence database, 2019

Figure 3-33 Summit County Wildfire Occurrence Density



Map compiled 10/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CO-WRAP

Figure 3-34 Fire Perimeters, Cause, and Year of Fire Occurrence in Summit County



Summit County has a pronounced summer fire season that peaks in July. Based on the county's CWPP, approximately 99% of the total Summit County population live within the WUI areas, so that summertime populations (which may include tourists and temporary visitors engaging in warmer weather activities) may be exposed to the highest wildfire risk.

Previous and recent occurrences of this hazard are described in more detail in the bullet points below.

- **June 1, 2018** – The Buffalo Mountain Fire near Silverthorne (reported to have started between Mesa Cortina and Buffalo Mountain trailheads) led to around 1,400 homes requiring evacuation, as well as road closures. That year was very dry and hot, and more than 800 firefighters were busy keeping homes along the fire's perimeters safe. The White River National Forest required closure due to this fire activity, especially near the Wildernest and Mesa Cortina subdivision areas. The cause of this fire was unknown. The area burned was near an area of a defensible space mitigation project funded by a FEMA Pre Disaster Mitigation grant in 2008-09. The project was considered to help reduce damages from the fire.
- **September 18, 2017** – The Tenderfoot 2 Fire started from a power pole insulator failure next to Highway 6 near Dillon, sources claim. The estimated 20 to 25 acres affected did not lead to any evacuations, but the Corinthian Hills and Oro Grande neighborhoods were under careful watch during the fire.
- **July 5, 2017** – The Peak 2 Fire was reported around 11 a.m. on July 5th, between Breckenridge and Frisco (in the Miner's Creek drainage area). It was about 2 miles north of the northernmost ski runs in Breckenridge, in a dense lodgepole and dead/down beetle-killed pine zone. The nearby community of Peak 7, which included around 463 properties, was evacuated. It is unknown what the cause of the fire was.
- **October 2, 2015** – Lightning caused the Brush Creek Ranch fire according to the U.S. Forest Service. The blaze that began during the afternoon of October 2 of that year as a small 1.5 acre fire was fully contained by 9 p.m. on October 4th. Over 100 firefighters and crewmembers were required to establish a fire line that eventually stopped the fire's spread. Mutual aid was provided by the Red, White and Blue Fire Rescue, the Copper Mountain Fire Department, Vail Fire and Emergency Services in nearby Eagle County, Kremmling Fire Protection District, and Alpine Hotshots, Park County, and Bureau of Land Management, the USFS, and a Department of Corrections Juniper Valley Hand Crew member.
- **March 29, 2012 –** Power lines in high winds ignited a 2.7 acre fire on Denver Water lands near Keystone Ski Resort. Several homes were evacuated, access to the town of Montezuma was closed and watershed lands were potentially threatened.
- **June 2, 2011 -** The Gulch Fire (Lake Dillon Fire Protection District, now part of Summit Fire & EMS) was caused by power lines in high winds near Keystone Ski Resort. It reached 18 acres and a Type III incident management team was mobilized. Thirty condominium units were evacuated. *Note, as of January 2020 Lake Dillon Fire Protection District is now Summit Fire & EMS.*
- **June 6, 2010 -** The Ruby Road Fire (Red, White, and Blue Fire Protection District) was started by juveniles and threatened a subdivision.
- **May 29, 2010 -** The Lake View Circle Fire (Red, White, and Blue Fire Protection District) was started by juveniles playing with fireworks and burned 1.8 acres. Several structures were threatened.
- **June 2006** - The Brinker Fire, near the Williams Fork Reservoir, was in Grand County, very close to the county line. It burned about 30 acres and was caused by arson.
- **September 19-20, 2005** - The Ophir Mountain Fire (Red, White, and Blue Fire Protection District) burned approximately 16 acres. Summit High School and about 50 homes were evacuated. Up to five homes were in immediate danger of being destroyed. Caused by a damaged power line, the fire spread quickly through beetle-killed lodgepole pine trees, mostly in the White River National Forest

near Farmer's Korner. The fire burned on land designated in the County's Community Wildfire Protection Plan as high priority because of heavy fuel loads, ground litter, and its proximity to development. Southbound State Highway 9 was closed at the Nordic Center in Frisco.

- **July 17, 2005** - The Meadow Creek fire burned 2 acres near the Meadow Creek trailhead in Frisco. It was human-caused and took four days to extinguish.

In addition, the HMPC noted the following about wildfires in the Planning Area:

- A fire in neighboring Grand County resulted in smoke issues for Summit County in the past.
- 2018 California fires also brought smoke into county.
- Fire bans are a common tool in the county to prevent potential fires.
- Campfires not put out completely have posed issues across the County.
- Summit County's Public Health noted receiving calls from tourists asking if they should cancel their trips because of smoke issues.

Probability of Future Occurrence

Highly Likely—Near 100% chance of occurrence next year or happens every year

Significant wildfires take place in Summit County every 2-3 years on average, based on the latest decade trends. As such the County will continue to experience wildfires on an annual basis, though larger ones may be less frequent.

The mature even-aged lodgepole pine stands found locally were established after heavy mining and settlement utilization from 1860 to 1940 (USDA 2004). These forests tend to experience either very small low intensity surface fires or high severity stand replacing fires. Large scale crown fires are infrequent, with fire return intervals on order of 100 to 300 years (Anderson 2003, Lotan et al 1985, Arno and Fielder 2005). The spruce-fir stands that develop on moist, cool sites also experience infrequent stand replacing fires on order of 150 to over 300 years apart.

Magnitude/Severity

Catastrophic—Multiple deaths possible; property destroyed and severely damaged highly likely; interruption of essential facilities and service for more than 72 hours common.

Potential losses from wildfires include the following:

- Injuries or deaths to people and wildlife
- Damages or losses to structures and other improvements
- Natural and cultural resources being impacted (e.g. burned down)
  - Losses of assets such as timber and ranges
  - Negative impacts to recreational opportunities
- Decreases in the quality and quantity of the water supply
- Economic losses
  - Tourist income reductions

Smoke and air pollution from wildfires can be a severe health hazard. In addition, wildfires can lead to secondary impacts due to vegetation loss such as future increases in flooding, landslides, and erosion during heavy rains.

Climate Change Considerations

The effects of climate change have the potential to impact wildfire behavior, the frequency of ignitions, fuel moisture, and fuel loads. Increasing temperatures may intensify wildfire threat and susceptibility to more frequent wildfires in the county. Forests are also sensitive to variable precipitation events and trees becoming more susceptible to pests and pathogens, in turn contributing to greater amounts of standing dead fuels.

Current scientific models expect Colorado will be affected by increased numbers of forest fires with added intensity due to longer warmer seasons, reduced distribution of biodiversity, lack of moisture, changes in ecosystems, drought impacts (e.g. pest diseases and continued spread of invasive species), and other impacts in coming years. The extending of the wildfire season into winter months, coinciding with seasonal high wind patterns, has contributed to severe fires in the last ten or so years. Mountainous zones of Colorado have seen many destructive wildfires in past years, whether natural or human caused, and the expectation is that worsening warmer and drier conditions would continue to impact Summit County and nearby areas.

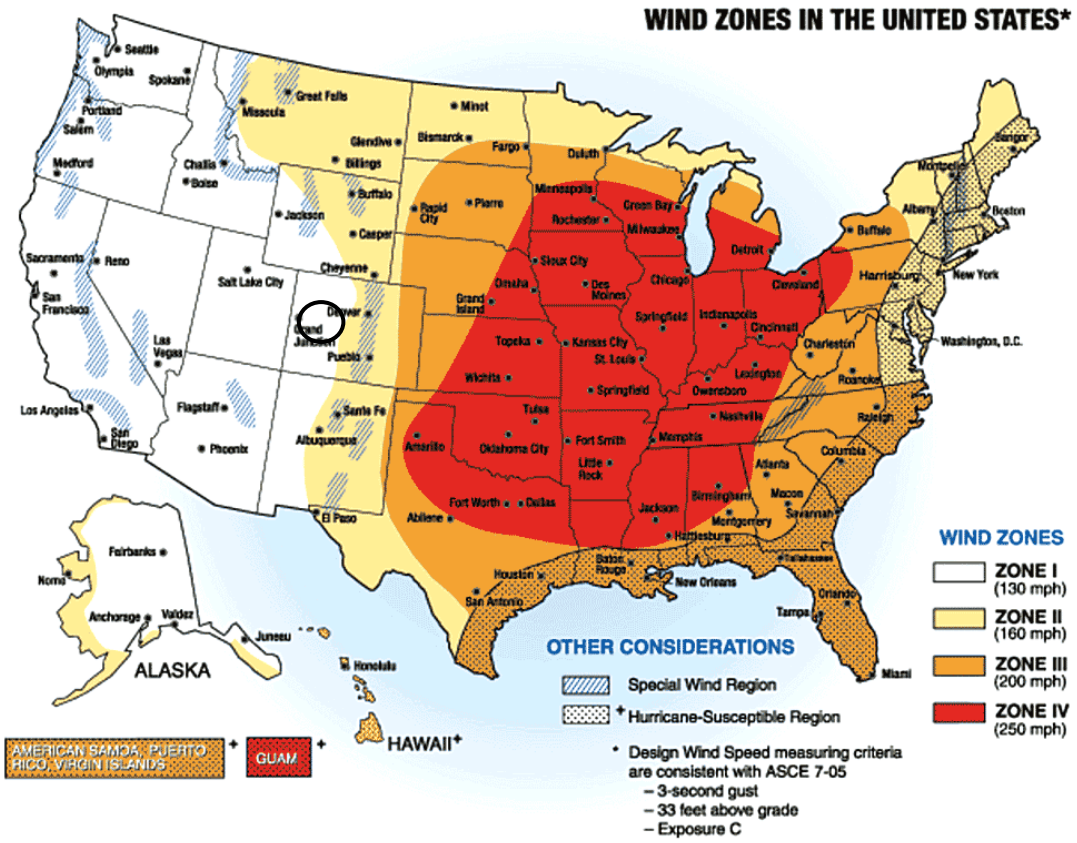
3.2.13 Windstorm

Hazard Description

High winds occur year round in Summit County. In the spring and summer, high winds often accompany severe thunderstorms. These winds are typically straight-line winds, which are generally any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 miles per hour (mph) that represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms. Straight-line winds may also exacerbate existing weather conditions, as in blizzards, by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snowstorms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel, such as tumbleweeds, around the region, and increasing the ferocity of existing fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

Figure 3-36 depicts wind zones for the United States. The map denotes that the majority of the County falls into Zone I which is characterized by high winds of 130 mph. The County borders Zone II, characterized by high winds of 160 mph.

Figure 3-35 Wind Zones in the United States



Source: FEMA

Geographic Location

The geographic extent of this hazard in Summit County is **large**—with 50 – 100% of the planning area affected.

High winds can occur throughout Summit County and may be most severe at high elevations. Frequent high winds at Dillon Reservoir make it a popular challenging technical sailing destination. There are sailing races here each weekend throughout the summer, and high winds often create hazardous conditions.

Previous Occurrences

Historical data from the National Centers for Environmental Information Storm Events Database was combined to determine that there were roughly 56 recorded wind events in Summit County between 1985 and 2018. (Note: These wind events were reported as high wind or thunderstorm wind events. The summary does not include winds that were part of severe winter weather - see Section 3.2.11 Severe Winter Weather.)

Data limitations: Some events may have been missed due to limitations in the manner in which events that occurred over multiple forecast zones are reported. Dollar figures reported for wind events in the NCEI Storm Events Database are total damages for all counties associated with an event. Specific Summit County losses are not available.

The event with the highest wind speed recorded at 116 miles per hour (mph) took place on November 12, 2005. According to the NCEI record the wind event peaked at 133 mph.

Notable events mentioned by the HMPC include the following:

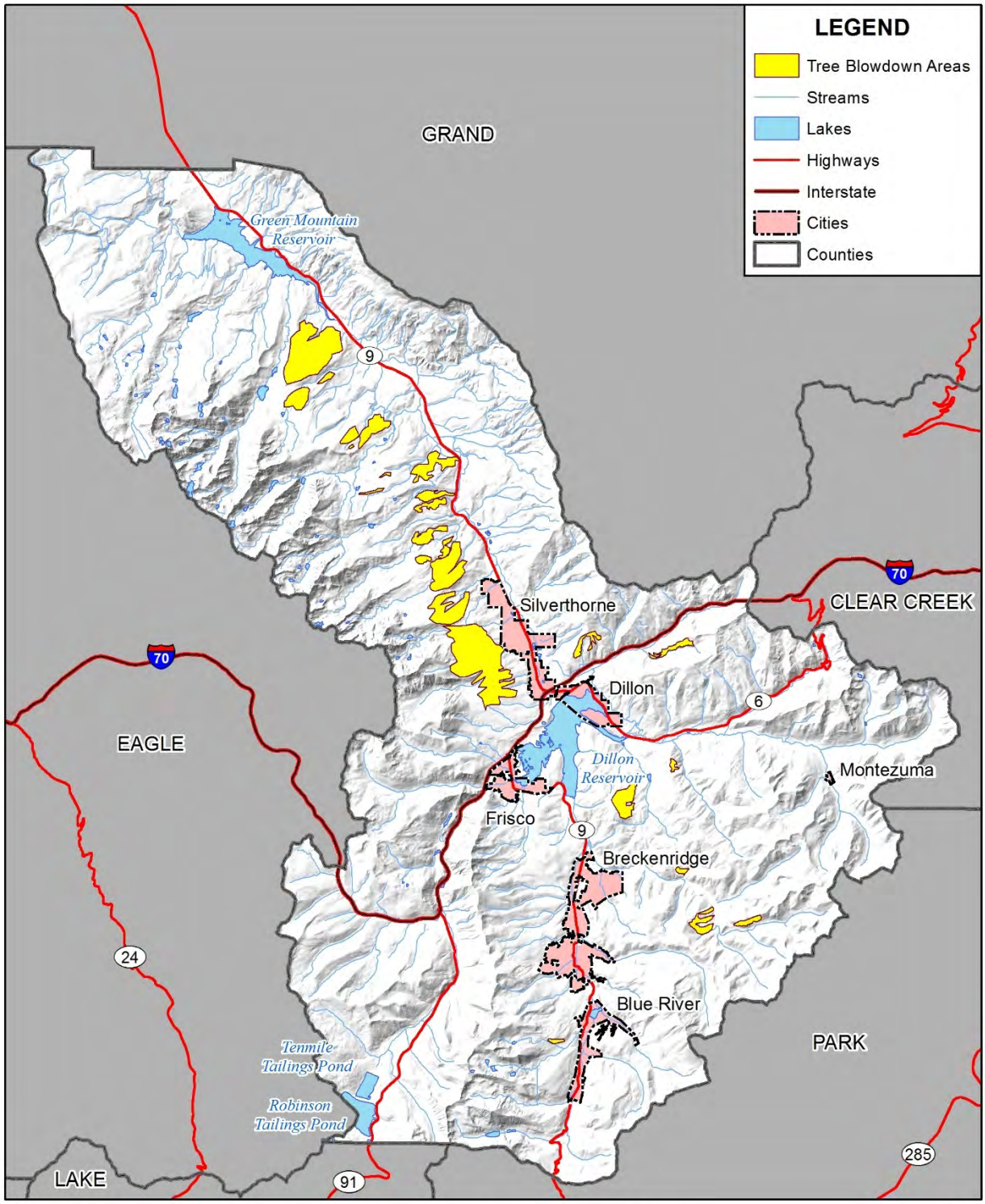
- **December 31, 2011—**NWS issued a high wind warning. Winds were clocked at 126 mph at Breckenridge Ski Area. At 5:53am, Summit County Dispatch was notified of an extensive power outage and explosions heard in the Breckenridge area. The outage was extensive, spanning from Agape Outpost to Hoosier Basin. Xcel reported a primary line down along Blue River Road and automatic switching equipment causing outages because of the wind's effects on transmission lines. Most power was back on by 1pm, though some homes did not have power until that evening. Trees were blown down on CR 450, 452, Peak 7, and 4 O'clock Road.
- **December 28, 2011—**NWS issued a high wind warning, but no incidents occurred in Summit County.
- **November 25, 2011—**High winds forced the gondola serving North Peak to close, leaving over 200 guests stranded at the restaurants overnight until 6:30am.
- **November 13, 2011—**Trees were blown down in the Breckenridge area. A small fire occurred as a result of a tree being blown into power lines.
- **June 2007**—A severe microburst in the area of Dillon Reservoir capsized a sailboat with four people onboard. A sheriff's deputy rescued the boaters; none were wearing floatation devices.
- **2002 (2003)**—There was a big windstorm on Dillon Reservoir.
- **1999 (2000)**—A microburst at Green Mountain Reservoir capsized a number of boats.
- **September 1986**—High winds at Dillon Reservoir broke up the marina, sinking six boats and damaging numerous others. Wind gusts of more than 70 mph were reported.

The following notable events have taken place since the County's 2014 HMP update:

- **February 14, 2014** - High winds occurred above timberline in Summit County in the early morning hours of the 14th. Peak wind gusts included: 89 mph, atop Loveland Pass and 8 miles south-southwest of Frisco; 76 mph, 1 mile south of Copper Mountain.
- **February 9, 2017** - Hurricane force winds toppled trees and knocked over several semis in and near the Front Range Mountains and Foothills. The Colorado Department of Transportation shut down Interstate 70 in both directions for a short time late between Beaver Brook and Silverthorne. Several trucks had been blown over and some cars received shattered windshields. High-profile vehicles and semi-trucks were barred from that area of the interstate until the wind weakened.
- **January 30, 2018** - A system that moved over the Pacific Northwest and across the Northern Rockies brought a period of high winds to areas in and near the Front Range Foothills. Peak wind gusts included: 101 mph atop Berthoud Pass; 97 mph near Loveland Pass.

The HMPC also reported that a microburst occurred in the Eagle's Nest Wilderness Area within Summit County in the last few years. Figure 3-37 depicts tree blowdown areas in Summit County.

Figure 3-36 Summit County Tree Blowdown Areas



Probability of Future Occurrence

Highly Likely—10-100% chance of occurrence in next year or has a recurrence interval of 10 years or less.

There were 56 significant recorded high wind events in the past 33 years in Summit County, which equals 1.6 wind event every year on average, or about a 100% chance of occurrence in any given year.

Magnitude/Severity

Table 3-19 shows the Beaufort Wind Scale. The replication of the scale only reflects land-based effects.

Table 3-18 Beaufort Wind Scale

Beaufort Number	Description	Windspeed (MPH)	Land Conditions
0	Calm	<1	Calm. Smoke rises vertically.
1	Light air	1 – 3	Wind motion visible in smoke.
2	Light breeze	3 – 7	Wind felt on exposed skin. Leaves rustle.
3	Gentle breeze	8 – 12	Leaves and smaller twigs in constant motion.
4	Moderate breeze	13 – 17	Dust and loose paper raised. Small branches begin to move.
5	Fresh breeze	18 – 24	Branches of a moderate size move. Small trees begin to sway.
6	Strong breeze	25 – 30	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic garbage cans tip over.
7	High wind, Moderate gale, Near gale	31 – 38	Whole trees in motion. Effort needed to walk against the wind. Swaying of skyscrapers may be felt, especially by people on upper floors.
8	Gale, Fresh gale	39 – 46	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.
9	Strong gale	47 – 54	Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.
10	Storm, Whole gale	55 – 63	Trees are broken off or uprooted, saplings bent and deformed. Poorly attached asphalt shingles and shingles in poor condition peel off roofs.
11	Violent storm	64 – 72	Widespread vegetation damage. Many roofing surfaces are damaged; asphalt tiles that have curled up and/or fractured due to age may break away completely.
12	Hurricane	≥ 73	Very widespread damage to vegetation. Some windows may break; mobile homes and poorly constructed sheds and barns are damaged. Debris may be hurled about.

Source: National Oceanographic and Atmospheric Association, http://www.spc.noaa.gov/faq/tornado/beaufort.html

Limited—Minor injuries and illnesses; minimal property damage that does not threaten structural stability; interruption of essential facilities and services for less than 24 hours

Windstorms in Summit County are rarely life threatening, but do threaten public safety, disrupt daily activities, cause damage to buildings and structures, increase the potential for other hazards (e.g., wildfire), and have adverse economic impacts from business closures and power loss. Power losses may be

increasing from high wind events due to the decreased forest health resulting from the pine beetle infestation. Dead trees and branches are more prone to being blown into power lines. Although windstorms are likely to occur in the future, data indicates that past losses have not been significant, and the overall magnitude of this hazard is limited.

Climate Change Considerations

According to the best data available at the time of this plan update, the future impacts of climate change on severe wind events are unclear.

3.2.14 Wildlife-Vehicle Collisions

Hazard Description

The development of highways and roads have led to the fragmentation of habitats for wildlife, making it challenging for them to access food, water, reproduce and migrate. Wildlife migration tends to take place during the dusk and dawn when it can be challenging for drivers to see. Most wildlife-vehicle collisions (WVCs) in the County involve deer and elk. Other large wildlife in the area include bighorn sheep, moose, lynx and black bears. Statewide there are nearly 4,000 WVCs annually resulting in 266 injuries and costing the state as much as $60 million a year.

Increased road development and expansion in the County as well as continued development that converts wildlife habitats for housing and associated development increases the risk of WVCs. Summit County is part of Colorado Department of Transportation (CDOT) Region 3; the most reported WVCs in the state occurred in this Region.

Geographic Location

The geographic extent of wildlife hazards in Summit County is large. It is possible for wildlife-vehicle collisions to occur on any of the County's roadways, though perhaps more likely along well traveled routes or near wildlife migration corridors.

State Highway 9 between Silverthorne and Kremmling, an area of urban and suburban development, is considered one of the deadliest stretches of the highway for both people and wildlife due to the topography and high speeds. In 2016, CDOT completed a wildlife crossing and underpass on a portion of Highway 9 in neighboring Grand County. In 2017 CDOT estimated that WVCs at this location decreased by 87% in one year.

The Summit County Safe Passages Plan (2017) identifies and prioritizes seventeen areas for wildlife movement across Summit County and the highways that cross the County. The Plan identifies Interstate 70, State Highway 9 and U.S. 6 as priority wildlife crossing areas due to safety hazards as well as the type of species impacted. The following table shows the segment of each highway identified in the Plan as safety hazards to motorists due to the high number of WVC crash reports, carcass records and observations by local Colorado Parks and Wildlife staff.

Table 3-19 Safety Hazard Wildlife Linkages in Summit County

Road/Linkage Name	Species
SH9, Upper Blue River	Elk, Deer, Moose
SH9, Gold Hill	Elk, Lynx
SH9, Maryland/Everist	Elk, Deer, Moose
SH9, Green Mountain Reservoir	Elk, Deer
I-70, Vail Pass	Elk, Lynx
I-70, Laskey Gulch	Elk, Lynx, Deer
SH9, Lower Blue River	Elk, Deer

Source: Summit County Safe Passages Plan

Previous Occurrences

Wildlife-vehicle collisions are, unfortunately, an often unavoidable part of life in rural areas. As the population of the planning area has grown over the past several years, the incidence of WVCs has increased accordingly. As noted above State Highway 9 is considered a deadly stretch of highway for both people and wildlife.

Table 3-21 shows the number of property damage only events (PDOs- refers to events in which no injuries or fatalities occurred), injuries, and fatalities from wildlife-vehicle collisions in Summit County between 2005 and 2017.

Table 3-20 Wildlife-Vehicle Collisions in Summit County, 2005-2017

Year	Property Damage Only	Injury	Fatality	Totals
2005	44	3	0	47
2006	29	2	0	31
2007	31	4	0	35
2008	39	2	0	41
2009	36	1	0	37
2010	35	2	0	37
2011	34	2	1	37
2012	38	9	0	47
2013	50	3	0	53
2014	50	2	0	52
2015	44	3	0	47
2016	49	6	0	55
2017	42	2	0	44
Grand Totals	**521**	**41**	**1**	**563**

Source: Colorado Department of Transportation

Probability of Future Occurrence

Vehicular accidents or encounters involving wildlife are highly likely to occur in any given year in Summit County. According to the CDOT data described in the previous table , a total of 563 wildlife-vehicle accidents occurred between 2005 and 2017. Five hundred and sixty-three incidents over a 12 year span of time averages out to 47 events per year, and about 3 a year that result in injuries. Note, wildlife collision data tends to understate the problem as they are based on incidents when drivers stayed at the crash scene and waited for a police officer to file a report. The probability of future WVC events in Summit County is likely.

WVCs are most likely to occur between dusk and dawn, particularly during migration seasons (spring and fall). Additionally, traffic in Summit County increases seasonally during ski season. This increases exposure to wildlife-vehicle hazards in the County between roughly September and April. Incidentally, ski season corresponds with deer and elk migration season, potentially increasing the likelihood of WVCs.

Magnitude/Severity

The impacts of wildlife-human hazards in Summit County would likely be negligible. Less than 10 percent of the planning area would be affected by any single event. Generally, only a few people are affected by a wildlife hazard at any one time, although injuries or death are possible. It is unlikely that critical facilities and services would be impacted.

Climate Change Considerations

According to the best data available at the time of this plan update, the future impacts of climate change are expected to influence future WVC events, but the extent of these impacts is as yet unknown. Climate Change is projected to cause major shifts in species habitat forcing wildlife to migrate in search of new habitats and potentially using different routes and patterns as resources become scare in their home habitats. Records dating back to the ice age shows shifts in species distributions as a result of a changing climate (Lister, Brocki and Ament 2105). Additional research is needed to determine the effects of climate change on the location, extent/intensity, frequency, and high-season duration of WVCs.

Hazard Significance Summary

This section summarizes the results of the hazard risk assessment and assigns a level of overall planning significance to each hazard of low, moderate, or high. Significance was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the planning area; thus, enabling the County to focus resources where they are most needed. Those hazards that occur infrequently or have little or no impact on the planning area were determined to be of low significance.

The following table summarizes the results of the hazard profiles for incorporated communities that are participating jurisdictions in the hazard mitigation plan. Details for special districts are available in their individual annexes.

Table 3-21 Planning Significance of Identified Hazards by Jurisdiction

Hazard Type	Summit County	Blue River	Breckenridge	Dillon	Frisco	Montezuma	Silverthorne
Avalanche	High	Low	Low	Low	Low	Low	Low
Dam Failure	Medium	Medium	Medium	Medium	Low	Low	High
Drought	Moderate	Low	Medium	Low	Medium	Medium	Medium
Earthquake	Low	Low	Low	Low	Low	Low	Low
Erosion/Deposition	Low	Medium	Low	Medium	Medium	Low	Low
Flood	High	Medium	High	Low	Medium	Medium	High
Hazmat Release (Transporation)	Medium	Low	Low	High	High	Low	High
Landslide, Mudflow/Debris Flow, and Rockfall	Medium	Medium	Medium	Low	Low	Medium	Medium
Lightning	Medium	Low	Medium	Medium	Medium	Medium	Medium
Pest Infestation (Forest and Aquatic)	Medium	Medium	Medium	Medium	High	Medium	Medium
Severe Winter Weather	High	High	High	High	High	High	High
Wildfire	High	High	High	Medium	High	High	High
Windstorm	Low	Low	Low	Medium	Low	Low	Low
Wildlife-Vehicle Collisions	Low	Low	Low	Low	Low	Low	Low

3.3 Vulnerability Assessment

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

3.3.1 Methodology

The vulnerability assessment further defines and quantifies populations, buildings, critical facilities and infrastructure, natural/cultural resources, and other community assets at risk to natural hazards, as well as the potential impacts to the economy and future development trends of the planning area.

The vulnerability assessment includes these sub-sections per applicable hazard:

- General Property
- People
- Critical Facilities and Infrastructure
- Economy
- Historic, Cultural, and Natural Resources
- Future Development
- Risk Summary

The vulnerability assessment was conducted based on the best available data and the overall planning significance of the hazard. Data sources which supported this vulnerability assessment included the following (among others):

- Summit County GIS data (hazards, base layers, and assessor's data);
- Statewide GIS datasets to support mitigation planning (e.g. Colorado Wildfire Risk Assessment Portal, or CO-WRAP);
- Federal GIS and other data sources (e.g. U.S. Census Bureau; U.S. Forest Service; U.S. Fish and Wildlife; Federal Emergency Management Agency and Hazus inventory data; National Inventory of Dams by the U.S. Army Corps of Engineers; U.S. Geological Survey; National Park Service; U.S. Department of Agriculture);
- State of Colorado Hazard Mitigation Plan 2018;
- Summit County Hazard Mitigation Plan of 2013;
- Written descriptions of inventory and risks provided by the jurisdictions and the public;
- Other online data sources (cited where applicable);
- Data and information from other existing plans and studies; and
- Input from planning team members and staff from the County and local, state, and federal agencies (HMPC).

In addition, a capability assessment was conducted for each jurisdiction as part of the risk assessment process. A capability assessment identifies the existing programs, policies, plans, and projects that

mitigate or could be used to mitigate risk to disasters. This information can be found in the annexes for each jurisdiction.

3.3.2 Asset Inventory

This section assesses the population, structures, critical facilities and infrastructure, and other important assets in Summit County at risk to the profiled hazards.

General Property Exposure to Hazards

Table 3-26 shows the total number of improved parcels, properties, and their improvement and content values by jurisdiction. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here so that those non-developed or non-improved parcels were excluded for the purposes of conducting the vulnerability assessments in this Section 3.3. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a percent of the improvement value, specifically: 50% of the improvement value for Residential structures, 150% for Industrial and Utility structures, 100% for Agricultural, Natural Resources, and Commercial structures, and 0% for Exempt and Vacant parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each jurisdiction.

Table 3-22 Improved Parcel and Property Exposure by Jurisdiction

Jurisdiction	Parcel Totals	Total Properties*	Improved Values	Content Values	Total Values
Blue River	762	800	$516,501,499	$258,250,750	$774,752,249
Breckenridge	3,592	8,913	$6,299,592,008	$3,164,268,483	$9,463,860,491
Dillon	543	1,524	$650,169,679	$351,672,275	$1,001,841,954
Frisco	1,849	3,793	$1,898,663,287	$1,023,548,831	$2,922,212,118
Montezuma	59	65	$20,993,025	$10,496,254	$31,489,279
Silverthorne	2,203	2,716	$1,662,165,099	$921,970,749	$2,584,135,848
Unincorporated	8,870	17,214	$9,463,496,155	$5,562,069,915	$15,025,566,070
TOTAL	**17,878**	**35,025**	**$20,511,580,752**	**$11,292,277,256**	**$31,803,858,008**

Source: Summit County Assessors Data, November 2019.
*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table 3-27 below summarizes the same information as above, but this time by parcel type rather than jurisdiction. The below information indicates that most properties in Summit County are Residential, followed by Exempt, Commercial, Agricultural, Vacant, Utilities, Natural Resources, and Industrial.

For those vulnerability analyses to follow in Section 3.3.3, the number of properties at risk of the hazards available in geospatial format were obtained by overlaying the hazard threat layers with the parcel layer, all in GIS. To further refine the properties at risk, those properties with improvements classified as open space or common space were removed from the analysis to avoid counting them as developed.

The following hazards will have vulnerability summaries at the parcel level, due to the availability of hazard data for the geospatial overlay analysis: Avalanche, Dam Failure Incidents, Flood, Landslide (including Special Slide Hazard Areas), and Wildfire. However, Earthquake will also include damage and

loss estimates to general property based on the Hazus-derived information (more details under Section 3.3.3 Earthquake).

Table 3-23 Improved Parcel and Property Exposure by Parcel Type

Parcel Type	Parcel Totals	Total Properties*	Improved Values	Content Values	Total Values
Agricultural	47	143	$128,413,865	$128,413,865	$256,827,730
Commercial	439	1,528	$767,589,641	$767,589,641	$1,535,179,282
Exempt	1,939	2,600	$0	--	$0
Industrial	1	13	$797,324,710	$1,195,987,065	$1,993,311,775
Natural Resources	1	1	$1,827	$1,827	$3,654
Residential	15,410	30,623	$18,396,630,403	$9,198,315,202	$27,594,945,605
Utilities	2	2	$1,313,104	$1,969,656	$3,282,760
Vacant	39	115	$420,307,202	--	$420,307,202
TOTAL	**17,878**	**35,025**	**$20,511,580,752**	**$11,292,277,256**	**$31,803,858,008**

Source: Summit County Assessors Data, February 2013; 2010 U.S. Census

*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Land Use and Development Trends

Summit County is divided into four geographic basins, Lower Blue, Snake River, Ten Mile and Upper Blue, each with its own unique master plan to guide future development and address issues important to residents in that basin. In the past five years growth has been experienced in all four basin areas with a total of 31,240 residential units built of the 42,855 unit allowed per zoning as of the end of 2018 (Summit County). This represents 73% of the absolute residential build-out in both the unincorporated and incorporated areas. According to Summit County Planning the estimated realistic build-out for the county is 39,256 units with a realistic build-out of approximately 80% in both in unincorporated and incorporated areas. There are some factors that may act to increase build-out in the County. These factors included potential annexations and upzonings by towns of lands that are currently unincorporated or affordable workforce housing projects. Table 3-59 breaks down the County's residential build-out by basin. Policies in the County's Comprehensive Plan limit the creation of new density in the unincorporated areas of the county as one method in controlling development and absolute build-out. The County's Transfer of Development Rights (TDR) program works together with the Town of Breckenridge for upzonings within the Town limits and moves the potential for new development out of the wildland urban interface (WUI). The County also working closely with the other incorporated communities on joint planning agreements and coordinate land use planning.

Table 3-24 Summary of Residential Build-out Analysis of Properties in Summit County by Basin, December 2018

	Total Units Built to Date	Remining Units to be Built[1]	Additional Subdivision Potential[2]	Absolute Build-Out (%)[3]	Realistic Build-Out (%)[4]
Lower Blue Basin					
Unincorporated Area	3,648	1,790	930	57.20	74.57
Town of Silverthorne	2,344	307	1,558	55.69	84.29
Total	**5,992**	**2,097**	**2,488**	**56.60**	**78.09**
Snake River Basin					
Unincorporated Area	6,269	2,419	72	71.48	71.78
Town of Dillon	1,282	3	488	72.31	72.31
Town of Montezuma	47	34	0	58.02	58.02
Total	**7,598**	**2,456**	**560**	**71.52**	**71.52**
Ten Mile Basin					
Unincorporated Area	2,253	683	104	74.09	77.32
Town of Frisco	3,171	171		94.88	94.88
Total	**5,424**	**854**	**104**	**84.98**	**86.70**
Upper Blue Basin					
Unincorporated Areas	3,605	1,386	649	63.75	73.93
Town of Blue River	697	141	0	83.17	83.17
Town of Breckenridge	7,924	844	0	90.37	88.15
Total	**12,226**	**2,371**	**649**	**80.11**	**83.15**
Countywide Totals[5]					
Unincorporated Areas	15,775	6,278	1,755	66.16	73.54
Incorporated Areas	15,465	1,500	2,046	81.35	86.86
Total County[6]	**31,240**	**7,778**	**3,801**	**72.90**	**79.58**

Source: Summit County Planning Department, December 31, 2018, http://www.co.summit.co.us/DocumentCenter/View/179

[1]Remaining Units to be Built includes vacant single family residential lots or multi-family units which are permitted by zoning, but not yet built.

[2]Additional Subdivision Potential in Units refers to additional units that could be created by further subdivision under existing zoning classifications.

[3]Absolute Build-out is the sum of total units built to date, remaining units to be built, and additional units that could be created through subdivision. Absolute build-out represents "ultimate build-out," or the total number of units that could potentially be built if every property were subdivided and developed to the maximum density allowed under current zoning regulations. Absolute build-out does not factor in site constraints that could preclude realization of the full development potential allowed under existing zoning regulations.

[4]Realistic build-out is a more likely picture of the build-out that may occur. Factors that affect realistic build-out include, but are not limited to the following: constrained property sizes in areas such as Heeney; development constraints such as wetlands and steep slopes; access constraints; unrealized subdivision potential on rural agricultural properties (due to property owners' desires, future conservation easements, open space purchases, etc.); and constrained development due to water rights issues.

[5]Build-out for the unincorporated portions of the County, and the Towns of Blue River and Montezuma has been calculated by the Summit County Planning Department and updated as of December 31, 2018. Build-out for the remaining four towns in the County (Breckenridge, Frisco, Dillon, and Silverthorne) was obtained from the respective Town Planning Departments. 6Commercial build-out for the County is not included in this analysis. Overall, there is not a significant amount of commercially zoned land within the unincorporated areas of the County, as most commercial activity is located within the incorporated towns. Furthermore, commercial build-out is somewhat difficult to estimate, as permitted commercial development varies based on a ratio of floor area to land area. As of December 31, 2018, it is estimated that commercial build-out in unincorporated portions of the County is approximately 62%. Generally, there is a significant amount of property zoned for commercial uses that could still be developed.

There are six major locations of urban growth in the County: Breckenridge, Frisco, Dillon, Silverthorne, Keystone, and Copper Mountain. It is anticipated that future higher density and higher intensity development will continue to be focused in these locations. In 2019 the County saw a 10% increase in building permit requests in the first nine months of the year compared to all of 2018. The Town of Silverthorne experienced much of new construction as well as the Town of Frisco, which saw a 66% increase in building permit applications in the same time period. Much of the growth in Frisco has been related to commercial buildings and apartments. While Countywide construction of single family residences have remained stagnant in first half of 2019. The county also experienced an increase in on-mountain projects at Copper Mountain Resort and workforce housing at Keystone. The White River National Forest, managed by the U.S. Forest Service (USFS) occupies over 80% of the County's total land area, thus confining growth to the remaining 20% of non-federal land. According to the Community Development Department in 2018, the County worked with the USFS on an potential land trade on four properties including a 2-3 acre housing site on Peak 7, a 7.5 acre parcel at Keystone Gulch, a 4.17 acre parcel near Tenderfoot and the Lake Hill Extension parcel at 15.42 acres (Summit County 2018). While the negotiations are ongoing the County plans to work toward adding these parcels into the housing inventory for the development of future workforce housing.

Future Development

As indicated in the previous section, Summit County has grown substantially over the last four decades. Population growth in the county is expected to continue. The State Demography Office forecasts the County's population will reach 31,122 by 2020 and 40,478 by 2040. Although growth is projected to continue through 2030, the growth rates experienced during the 1970s, 80s, and 90s are not expected to continue. Table 3-60 shows the population projections for the County as a whole through 2030.

Table 3-25 Population Projections for Summit County, 2010-2030

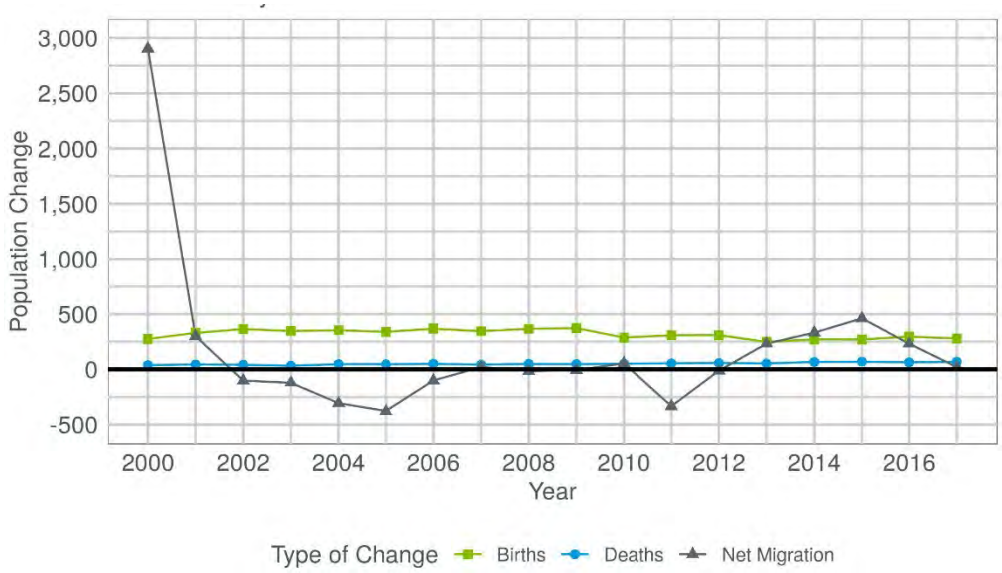
Time Frame/Years	Percent Change	New Residents Added	Projected Ending Population
2010-2015	9.6%	2,674	30,668
2015-2020	14.8%	4,553	35,221
2020-2025	12.7%	4,481	39,702
2025-2030	10.1%	4,000	43,702

Sources: Summit County Planning Department, http://www.co.summit.co.us/index.aspx?NID=519

The County has estimated the arrival of 15,708 new permanent residents between 2010 and 2030 (20 years) or 785 new permanent residents per year, 65 new permanent residents per month and approximately two new permanent residents per day (Summit County Planning Department).

The net migration of the County, or the difference between the number of people moving into County and the number of people out, between 2013 and 2017 was 1,265 persons while the total natural increase was 1,296 over the same period. The following figure from the State Demography office shows the components of change for Summit County between 2000 and 2017.

Figure 3-37 Summit County Components of Change Births, Deaths and Net Migration, 2000-2017



Source: Colorado State Demography Office

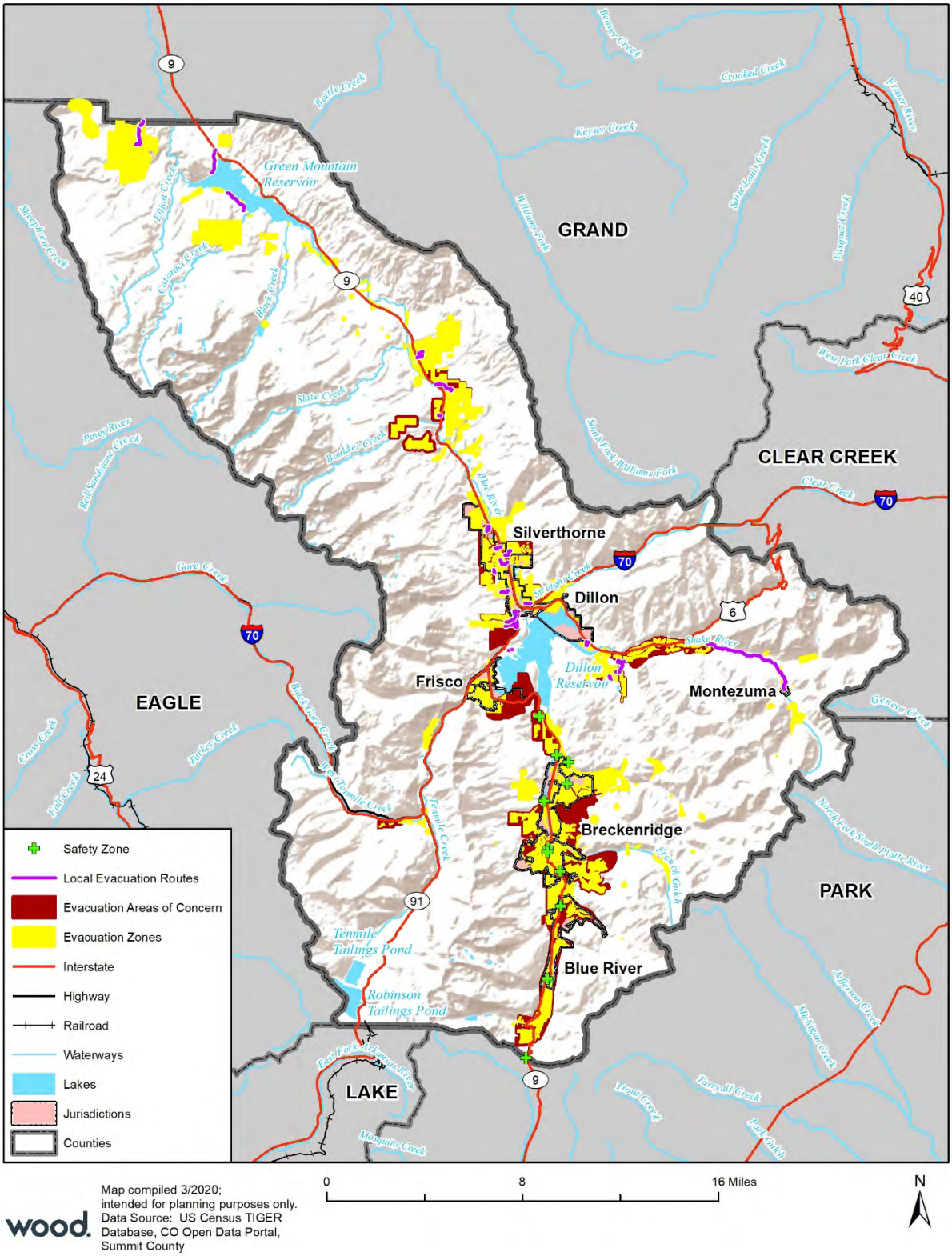
The unincorporated areas of the County do not have a significant amount of areas commercially zoned and much of the future commercial growth will take place in the incorporated areas of the county. The Town of Silverthorne has the greatest potential for commercial growth followed by Frisco and Dillon. The Town of Frisco alone experienced an increase of 66% in 2019 of building permit applications for commercial development. On-mountain projects have increased in recent years with development at Copper Mountain Resort and Keystone. Resort growth and redevelopment is projected to continue. Development along any of the river corridors, especially the Blue and Snake rivers, are subject to risk from seasonal flooding in the spring when the snowpack is above average.

The build-out analysis in the County's Comprehensive Plan revealed that there are significantly more residential units built in the Upper Blue Basin than any other basin (including both unincorporated areas and incorporated towns). The Ten Mile Basin is the most built-out of the four basins with an absolute build-out of 85%. The Upper Blue Basin continues to have the most remaining development potential among the four basins, with an "absolute" build-out potential of approximately 15,261 residential units (nearly 40% of the units permitted within the entire County). Hazard vulnerability in the Upper Blue Basin may increase as the area is built out in the future. Of the incorporated communities, the Town of Frisco is 95% built-out followed by the towns of Blue River and Breckenridge.

The Interstate 70 corridor and U.S. 6 over Loveland Pass will continue to experience increased traffic with the greatest risks associated with snow and rock/mudslides in areas prone to such activity. U.S. 6 will likely continue to serve as a hazardous materials commercial truck route for the foreseeable future. Major

accidents or significant snow events can result in the closure of vital highways and roads such as Interstate 70, U.S. 6, Colorado Highway 9, and the Dillon Dam Road, stranding several thousand motorists during seasonal and weekend peak travel periods in the County. Future growth will further exacerbate both the congestion and need to establish an adequate number of pre-designated emergency reception centers and emergency shelters. The Summit County Office of Emergency Management has already coordinated evacuation planning for jurisdictions in the County. The figure below shows evacuation routes and identified areas of concern.

Figure 3-38 Summit County Evacuation Routes and Areas of Concern



People

As part of the planning process, the HMPC looked at changes in growth and development in terms of land use trends and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability. Information from the Summit County Countywide Comprehensive Plan and website, the Colorado Department of Local Affairs Demography Section, and the U.S. Census Bureau form the basis of this discussion.

According to the State Demography Office, the 2018 population of Summit County was 30,974. This is an increase of 10.3% from the 2010 U.S. Census population of 28,073. It is estimated that the growth rate for the County between 2015 and 2017 was 1.2% compared to the statewide growth rate of 1.5%. Tables 3-54 through 3-58 illustrate past growth in Summit County in terms of population, housing units, and density. Chapter 1 of this plan provides additional details of the current demographics of Summit County and the incorporated jurisdictions within the county.

Table 3-26 Summit County Population Growth 1970-2018

Time Frame/Years	Percent Change (%)	# Change	Estimated Ending Population
1970-1980*	+232.0	+6,183	8,848
1980-1990	+45.6	+4,033	12,881
1990-2000	+82.8	+10,667	23,548
2000-2010	+18.9	+4,446	27,994
2010-2018	+10.3	+2,901	30,974

Source: Summit County Planning Department, http://www.co.summit.co.us/index.aspx?NID=518, and Colorado State Demography Office *Summit County was the fastest growing county in the nation

A majority of the County's population live in the unincorporated areas. According to Summit County Planning the unincorporated area known as Snake River Basin has seen as the greatest increase in population since 2010. Most of the growth occurred in the neighborhoods of Cove and Dillon Valley which are the two largest and most densely populated neighborhoods in the County. As shown in Table 3-55, all of the incorporated communities have seen growth since 2010, the Town of Silverthorne has seen the greatest increase (23%) followed by the Town of Frisco, in population since 2010.

Table 3-27 Population Growth for Jurisdictions in Summit County, 2010-2018

Jurisdiction	2010	2018	# Change	% Change	Percent of County (%)	Percent of Total Growth (%)
Blue River	853	926	73	9%	3%	2.5%
Breckenridge	4,552	4,989	437	10%	16%	15.1%
Dillon	906	968	62	7%	3%	2.1%
Frisco	2,694	3,194	500	19%	10%	17.2%
Montezuma	65	67	2	3%	0.2%	0.07%
Silverthorne	3,904	4,789	749	23%	15%	30.5%
Unincorporated Areas	15,099	16,041	881	6%	52%	32.5%
Total County	**28,073**	**30,974**	**2,561**	**9%**	**100%**	**100%**

Source: 2010 US Census and State Demography Office

The following tables compare and show percentage change for select demographic characteristics in unincorporated Summit County only between 2012 and 2017 as well as a comparison of characteristics with the state of Colorado and the United States. Similar tables for the incorporated communities can be found in each participating jurisdiction's annex.

Table 3-28 Summit County Demographic and Social Characteristics, 2012-2017

Summit County	2012	2017	% Change
Median Age	36.3	39.2	8.0%
Total Housing Units	29,781	30,652	2.9%
Housing Occupancy Rate	38.1%	30.8%	-19.2%
% of Housing Units with no Vehicles Available	3.3%	1.6%	-51.5%
Median Home Value	$460,500	$547,700	18.9%
Unemployment	4.9%	2.6%	-46.9%
Mean Travel Time to Work (minutes)	16.7	16.4	-1.8%
Median Household Income	$64,680	$73,538	13.7%
Per Capita Income	$34,575	$37,192	7.6%
% Without Health Insurance	21.6%	21.4%	-0.9%
% of Individuals Below Poverty Level	11.8%	10.3%	-12.7%
# of Households	11,358	9,455	-16.8%
Average Household Size	2.4	3.1	29.2%
% of Population Over 25 with High School Diploma	95.4%	93.4%	-2.1%
% of Population Over 25 with Bachelor's Degree or Higher	49.1%	47.8%	-2.6%
% with Disability	3.7%	6.1%	64.9%
% Speak English less than "Very Well"	7.8%	7.5%	-3.8%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table 3-29 Summit County Demographic and Social Characteristics Compared to State and Nation

Demographic & Social Characteristics (as of 2017)	County	Colorado	U.S.
Median Age	39.2	36.5	37.8
Housing Occupancy Rate	30.8%	89.8%	87.8%
% of Housing Units with no Vehicles Available	1.6%	5.3%	8.8%
Median Home Value	$547,700	$286,100	$193,500
Unemployment	2.6%	5.2%	6.6%
Mean Travel Time to Work (minutes)	16.4	25.2	26.4
Median Household Income	$73,538	$65,458	$57,652
Per Capita Income	$37,192	$38,845	$31,177
% Without Health Insurance	21.4%	9.4%	10.5%
% of Individuals Below Poverty Level	10.3%	11.5%	14.6%
Average Household Size	3.1	2.55	2.63
% of Population Over 25 with High School Diploma	93.4%	91.1%	87.3%
% of Population Over 25 with bachelor's degree or Higher	47.8%	39.4%	30.9%
% with Disability	6.1%	10.6%	12.6%
% Speak English less than "Very Well"	7.5%	6.0%	8.5%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table 3-30 Growth in Housing Units for Jurisdictions in Summit County, 2010-2018

Jurisdiction	2010	2018	# Change	Percent Change (%)	Percent of County (%)	Percent of Total Growth (%)
Blue River	728	764	36	5%	2%	2%
Breckenridge	6,915	7,337	422	6%	23%	24%
Dillon	1,290	1,331	41	3%	4%	2%
Frisco	3,123	3,578	455	15%	11%	26%
Montezuma	55	55	0	0%	0%	0%
Silverthorne	2,066	2,449	383	19%	8%	22%
Unincorporated Areas	15,684	16,110	426	3%	51%	24%
Total County	**29,861**	**31,624**	**1,763**	**50%**	**100%**	**100%**

Source: State Demography Office

According to the Countywide Comprehensive Plan, seasonal population may swell to nearly 160,000 people during peak periods (i.e., December or March). Monthly average population fluctuation indexes indicate that March has the highest seasonal population with 147.4% of average occupation; May has the

lowest with 54.1% of average. The plan also notes that there are more housing units than residents (this is due to the dynamics of the County's resort community, there is still a need for additional housing).

For hazards for which data was available for GIS-based parcel analysis, population estimates were calculated as well. These were based on multiplying the average persons per household value for Summit County as of the latest U.S. Census Bureau statistics (which equals 3.10 persons per household), times the number of properties of Residential nature in each of the vulnerability analyses. Hence, if 'X' number of properties of Residential nature were found to overlap with a hazard layer, the total population exposed to that hazard would be obtained by taking 'X' times 3.10, then adding the results by either jurisdiction or parcel type. For more details, refer to each hazard's vulnerability section in the following sub-sections (Section 3.3.3). This method does not account for people associated with commercial or other properties, or seasonal or visiting populations.

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. Table 3-28 summarizes the inventory of critical facilities by type (based on best available data) in Summit County as provided by the HMPC and Summit County departments. Table 3-29 summarizes the same facilities by FEMA Lifelines, while Table 3-30 organizes them by jurisdiction. The locations of these facilities are displayed in Figure 3-38 below. For context, FEMA Lifelines represent the U.S. Department of Homeland Security's current recommended way to standardize the classification of critical facilities and infrastructure which provide indispensable service, operation, or function to a community. Per the FEMA Community Lifelines information sheet, "A lifeline provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security" (FEMA Community Lifelines, 2019). 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.

Specific information on facilities, names, and other key details by community can be found in the jurisdictional annexes. Note that there were several critical facilities the HMPC indicated should not be disclosed in terms of location or name, so while they were considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, they will not be described in detail nor will they be shown in any maps. Also, there were several private facilities that fall into the FEMA Lifelines framework that were not available in GIS. These facilities include pharmacies, grocery stores and fuel stations. The County Jail is also considered a critical facility.

Table 3-31 Critical Facilities in Summit County by Facility Type

Critical Facility Type	Total Facilities
Ambulance Stations	4
Communications/Cell Towers	8
Energy Substations	4
Fire Lookout Locations	28
Fire Station	10
Government Buildings	40
HazMat Tier II SARA Facilities	17
Helipads	7
Incident Facilities	7
Information Centers	4
Medical Facilities	4
Police Stations	7
Public Safety Transmitters	5
Schools	12
Static Water Structures	20
Wastewater Facilities	18
TOTAL	**195**

Source: Summit County GIS, Summit County HMPC.

Table 3-32 Critical Facilities in Summit County by FEMA Lifeline

Critical Facility Type	Total Facilities
Communications	17
Energy	4
Food/Water/Shelter	38
Hazardous Materials	17
Health and Medical	8
Other/Schools	12
Safety and Security	92
Transportation	7
TOTAL	**195**

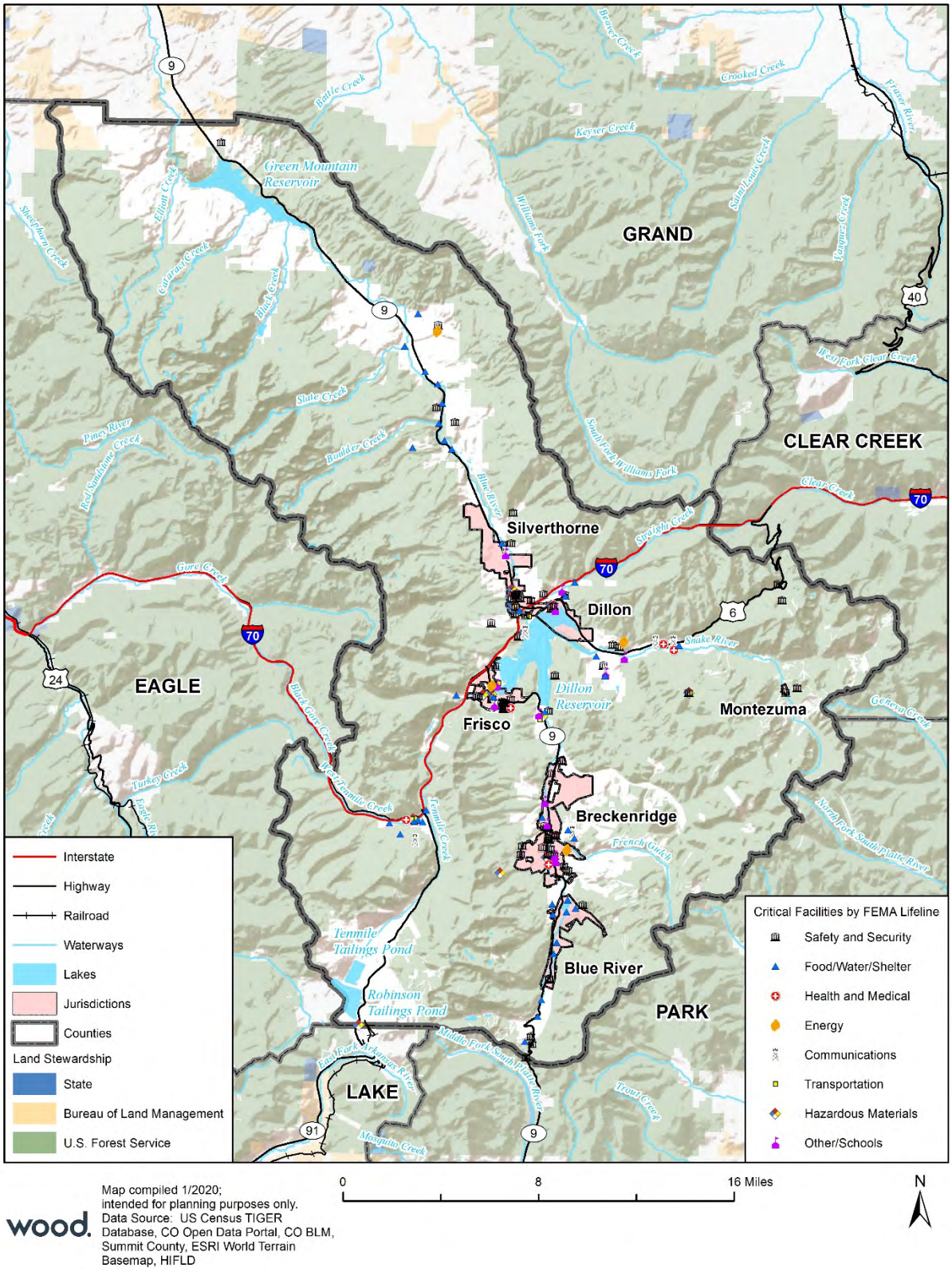
Source: Summit County GIS, Summit County HMPC.

Table 3-33 Critical Facilities in Summit County by Jurisdiction

Jurisdiction	Total Facilities
Blue River	9
Breckenridge	30
Dillon	9
Frisco	13
Montezuma	1
Silverthorne	20
Unincorporated	113
TOTAL	**196**

Source: Summit County GIS, Summit County HMPC.

Figure 3-39 Location of Critical Facilities in Summit County, by FEMA Lifeline Category

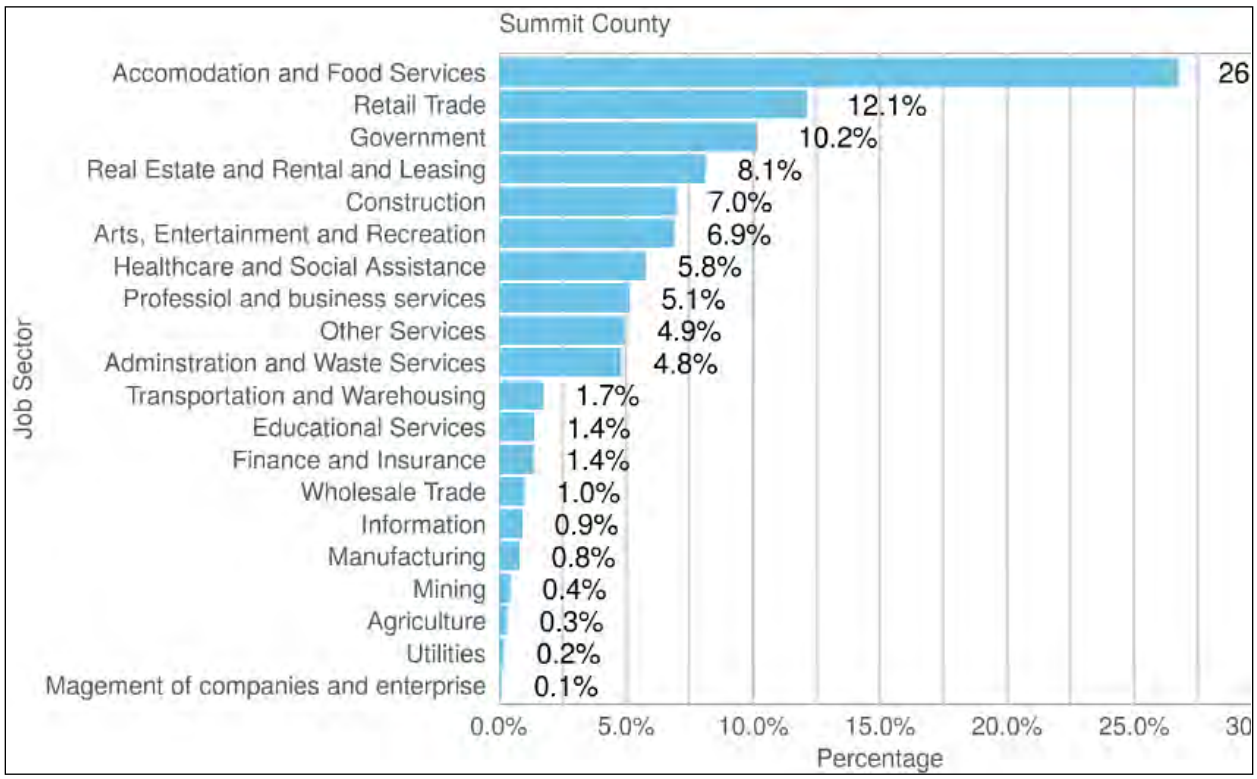


Other facilities in the County such as ski areas, venues that hold concerts, sporting events, and other locations that attract large numbers of people, may also be at higher risk due to concentrations of people

Economic Assets

Economic assets may include major employers, businesses, industries, and economic sectors such as tourism or agriculture, whose losses or inoperability would have severe impacts on the community, its ability to recover from a disaster, and then the ability to sustain the current way of life. After a disaster, economic vitality is the engine that drives recovery. Every community has a specific set of economic drivers, which are important to understand when planning ahead to reduce impacts to the economy stemming from hazard events and other potential disasters. When major employers are unable to return to normal operations, impacts ripple throughout the community. Figure 3-39 lists the top employment industries in Summit County based on comparison percentages among the job sectors in the County.

Figure 3-40 Estimated Share of Jobs by Industry in Summit County



Source: Colorado State Demography Office, 2017

It is evident by the information presented in the above figure that the County's largest employers are involved in the accommodation, food-related, retail, and recreation/tourism industry. Summit County is known for attracting worldwide visitors for its popular winter and summertime actives like skiing/snowboarding, hiking, or biking (among others). Year-round, hundreds of thousands of tourists stay and enjoy services from the many hotels and resorts in the county, which are part of the accommodation and food services category in the figure above. A natural hazard such as a major drought or wildfire could severely impact the industry and the County's economy (including the large retailers that are also among the largest employers). Other hazards that could affect key transportation routes (e.g.

Interstate 70, Highway 9) such as landslides, avalanches, or even a major flood, would additionally affect the local economy by preventing visitors and tourists from accessing the communities and spending in the local businesses and industries.

Historic, Cultural, and Natural Resources

Assessing the vulnerability of Summit County to disaster also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

A historic property not only includes buildings or other types of structures such as bridges and dams but can also refer to prehistoric or Native American sites, roads, byways, historic landscapes, and such other features. Given the history of the County, these types of historic properties exist; some are inventoried and listed in this plan.

Historic properties and cultural resources are also valuable economic assets that increase property values and attract businesses and tourists. Preservation of these assets is often an important catalyst for economic development (e.g., historic downtown revitalization programs leading to growth in heritage tourism). Some key information on historic assets and properties in Summit County was obtained from the *National Register of Historic Places* (NRHP). The NRHP database is the Nation's official list of cultural resources worthy of preservation, and the NRHP overall is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service (NPS), which is part of the U.S. Department of the Interior.

Based on this NRHP database, Summit County contains 4 historic resources, as shown in the following bullet list (where each structure/resource is followed by the Source Date):

- Frisco Schoolhouse, in western Frisco – 9/15/1983
- Wildhack's Grocery Store-Post Office, in central Frisco – 5/16/1985
- Slate Creek Bridge, to the west of Highway 9 in north-central Unincorporated Summit County – 6/24/1985
- Montezuma Schoolhouse, in the Town of Montezuma – 1/9/2007

Colorado has a similar historical resource record, called the *Colorado State Register of Historic Properties*. This database contains the state's significant cultural resources worthy of preservation for the future education and enjoyment of Colorado's residents and visitors. Properties listed in the Colorado State Register include individual buildings, structures, objects, districts, and historic and archaeological sites. The Colorado State Register program is administered by the Office of Archaeology and Historic Preservation within the Colorado Historical Society. Properties listed in the National Register of Historic

Places are automatically placed in the Colorado State Register. Based on this statewide record set, Summit County contains additional resources deemed historic preservation-worthy:

- Boreas Railroad Station Site, southeast of Breckenridge – 10/28/1993
- Breckenridge Historic District, Breckenridge – 4/9/1980
- Masonic Placer Cemetery/Valley Brook Cemetery, central-west Breckenridge – 7/18/2014
- Porcupine Peak Site, east of Dillon – 8/1/1980
- Soda Creek Homestead, off Keystone Ranch Road – 3/1/2010
- Staley-Rouse House, central Frisco – 5/31/2007

After the early Native American nomadic populations who occupied the region from the mid-16th to the late 19th century, valuable gold and other mineral deposits brought early settlers to Summit County, leading to major development (Colorado Encyclopedia, 2019). Mineral extraction operations today are very few, but many of the old mines are treasured historic assets of the county. For example, Summit County's Breckenridge Historic District noted in the Colorado State Register of Historic Properties list above is one of Colorado's largest collections of historic buildings and structures, and a defining element in the Town of Breckenridge's identity and tourist appeal. Several historic mine structures are preserved in this district. The Town has adopted standards geared towards properly conserving historic properties and protecting the character of the district (Town of Breckenridge, 2017).

One other asset of interest to the County is the Top of the Rockies National Scenic Byway. Administered by the Federal Highway Administration, national scenic byways are so designated to preserve and protect the nation's scenic but often less-traveled roads and promote tourism and economic development. Any hazard-related damage done to the Top of the Rockies (or damage that affects access) could have negative implications on tourism, and thus the economy, in Summit County. The HMPC also noted that the Rice Building in Summit Cove contains a large collection of cultural resources.

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register, also as stated under the National Historic Preservation Act (NHPA). Thus, in the event that the property is to be altered or has been altered as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA and the NHPA regarding this key age period. For example, by law under the NHPA, "members of the public have a voice when federal actions will affect properties that qualify for the National Register of Historic Places, the nation's official list of historic properties" (A Citizen's Guide to Section 106 Review, 2016). Structural mitigation projects are considered alterations for the purpose of these NEPA/NHPA regulations.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetland areas protects sensitive habitat as well as attenuates and stores floodwaters.

A number of natural resources exist in Summit County including wetlands, endangered species, and imperiled plant communities.

Wetlands

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

Between the 1780s and 1980s, over half of the wetlands in Colorado were lost due to human activities (e.g., filling and other degrading activities) (Yuhas, 1996). In Summit County, wetland loss has resulted from historic gold mining and large construction projects such as Interstate 70 and Dillon and Green Mountain reservoirs. In more recent years, construction of single-family residences, as well as other types of development, has resulted in a cumulative and permanent wetland loss in the County.

Endangered Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (endangered and threatened species) in the planning area. An *endangered* species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A *threatened* species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are a third category of plants and animals at risk, but these have been proposed as endangered or threatened but are not currently listed.

According to the U.S. Fish and Wildlife Service (USFW) Environmental Conservation Online System (ECOS), there were 12 federal endangered, threatened, or candidate/proposed/under review species in Summit County (as of November of 2019). These are listed in Table 3-31.

Table 3-34 At-Risk Wildlife Species in Summit County

Type of Species (Group)	Common Name	Scientific Name	Status
Amphibians	Boreal toad	Anaxyrus boreas	Under Review
Birds	Mexican spotted owl	Strix occidentalis lucida	Threatened
Birds	Yellow-billed Cuckoo	Coccyzus americanus	Threatened
Fishes	Colorado pikeminnow (squawfish)	Ptychocheilus lucius	Endangered
Fishes	Greenback Cutthroat trout	Oncorhynchus clarkii stomias	Threatened
Fishes	Humpback chub	Gila cypha	Endangered
Flowering Plants	Osterhout milkvetch	Astragalus osterhoutii	Endangered
Flowering Plants	Penland alpine fen mustard	Eutrema penlandii	Threatened
Flowering Plants	Western prairie fringed Orchid	Platanthera praeclara	Threatened
Insects	Uncompahgre fritillary butterfly	Boloria acrocnema	Endangered
Mammals	Canada Lynx	Lynx canadensis	Threatened
Mammals	North American wolverine	Gulo luscus	Proposed Threatened

Source: USFW ECOS, 2019

Imperiled Natural Plant Communities

According to the Colorado Natural Heritage Program, there are a number of natural plant communities in Summit County that have been identified as imperiled, critically imperiled, or imperiled/rare or uncommon. These communities are listed below.

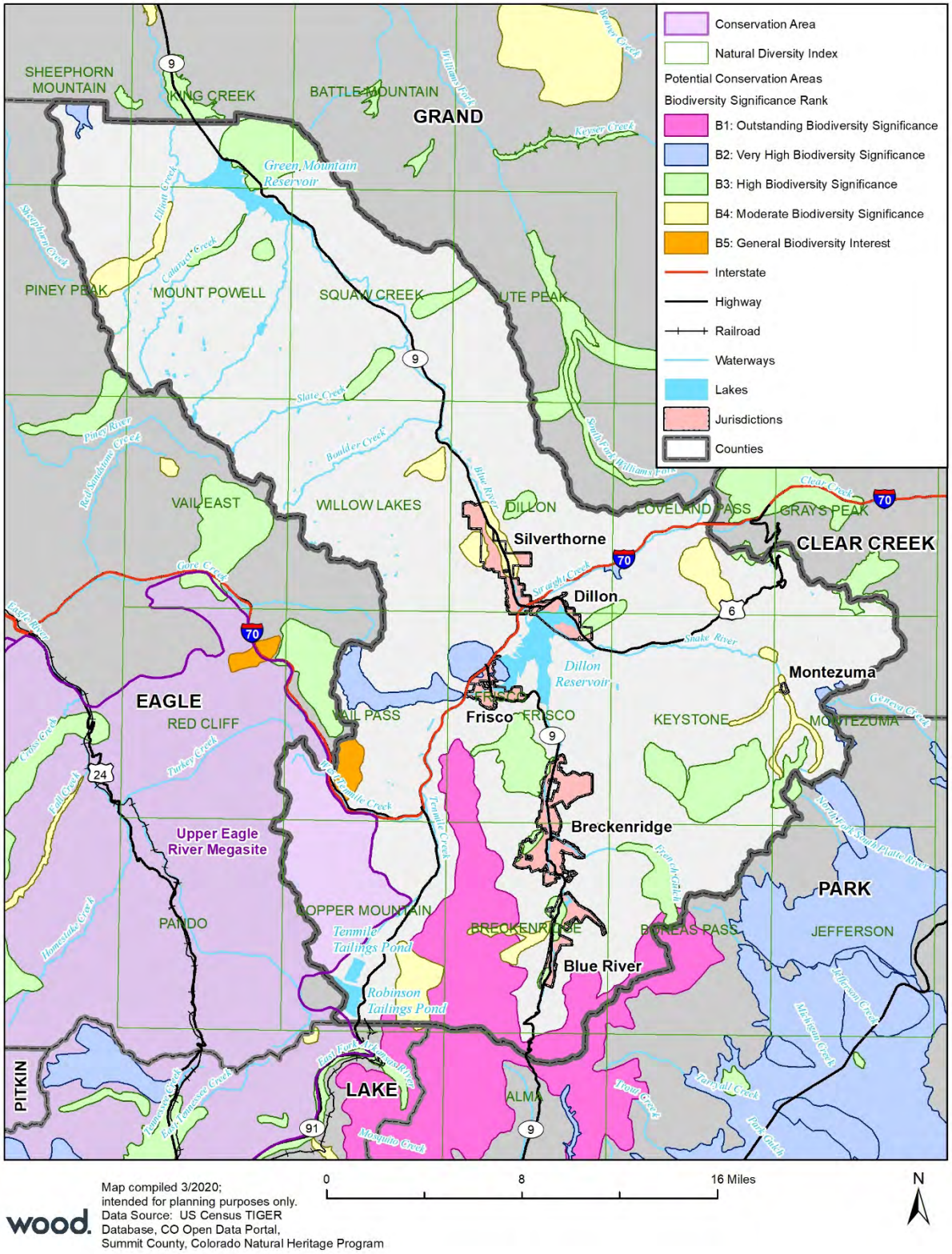
- Alpine meadows
- Alpine wetlands
- Alpine willow scrub
- Clustered sedge wetland
- Drummonds willow/mesic forb
- Geyer's willow/beaked sedge
- Geyer's willow – Rocky Mountain Willow/mesic forb
- Lower montane forests
- Lower montane woodlands
- Mesic alpine meadows
- Montane aspen forest
- Montane floating/submergent wetland
- Montane riparian forest
- Montane riparian shrubland
- Montane riparian willow carr
- Montane willow carr
- Subalpine riparian shrubland
- Subalpine riparian willow carr
- Western slope floating/submerged palustrine wetlands
- Western slope sagebrush shrublands

Ecologically Sensitive Areas

Figure 3-40 is a map of ecologically sensitive areas that displays the areas in Summit County where threatened and endangered species and imperiled natural plant communities are most likely to be found. The map shows statewide potential conservation areas identified by Summit County and the Colorado Natural Heritage Program. These are best estimates of the primary areas required to support the long-term survival of targeted species or natural communities. Each conservation area is given a biodiversity rank of B1 (most significant) through B5 (general interest) based on observed occurrences in the area. Part of Frisco has a biodiversity rank of B2 (very high), and parts of Blue River, Breckenridge, and Dillon have biodiversity ranks of B3 (high).

The map also shows statewide Network of Conservation Areas (NCA) identified by the Colorado Natural Heritage Program that are located in Summit County. An NCA may represent a landscape area that encompasses potential conservation areas that share similar species or natural communities and ecological processes. It may also represent a mostly intact, lightly fragmented landscape that supports wide-ranging species and large scale disturbances and include unoccupied or not surveyed areas that demonstrate the connectivity of the landscape. The only currently designated NCA in Summit County is the Upper Eagle River Megasite, which includes part of Copper Mountain and the area to the west in Eagle and Lake Counties.

Figure 3-41 Summit County Ecologically Sensitive Areas



3.3.3 Vulnerability by Hazard

The Summit County Risk Assessment revealed a number of problem areas to be addressed in the mitigation strategy. This section describes overall vulnerability and identifies structures and estimates potential losses to buildings, infrastructure, and critical facilities located in identified hazard areas.

This assessment is also limited by the data available for the hazards. The methods of analysis vary by hazard type and data available. Many of the identified hazards, particularly weather related hazards, affect the entire planning area, and specific hazards areas cannot be mapped geographically. For these hazards, which include drought, lightning, pest infestation, severe winter weather, and windstorm, vulnerability is mainly discussed in qualitative terms because data on potential losses to structures is not available. Geographic hazard areas can be mapped for the following identified hazards: avalanche; dam failure; earthquake; flood; landslide, mudflow/debris flow, and rock fall; and wildfire.

Avalanche

Overall, public safety is the primary concern regarding avalanche hazards and vulnerability. Avalanches also cause road and highway closures. Road closures and the associated economic losses are another impact of avalanches, but also necessary to mitigate risk to motorists. The County has multiple programs and partnerships in place to reduce avalanche risk, which are summarized in Annex A.

The following sub-sections will discuss in more detail the specific impacts that property, populations, critical facilities and infrastructure, and other aspects of the county's way of life (the economy, local resources of interest, and future development) may be affected negatively by this hazard.

General Property

The Colorado Avalanche Information Center (CAIC) has mapped certain avalanche zones across the state, some of which are found in Summit County as displayed in Figure 3-1 under Section 3.2.1. These are current as of November of 2019. The CAIC avalanche path data is limited in the scope and does not identify all areas of avalanche hazard. The data is limited to maps of paths where avalanches pose a threat to state and federal highways.

A GIS analysis using CAIC provided avalanche hazard mapping available as of December of 2019 was performed, with the parcel data for Summit County as described in Section 3.3.1 Methodology. The results indicated the following (summarized in Table 3-32 below) about the 5 properties found in avalanche path areas.

Table 3-35 Properties in CAIC Avalanche Path Areas

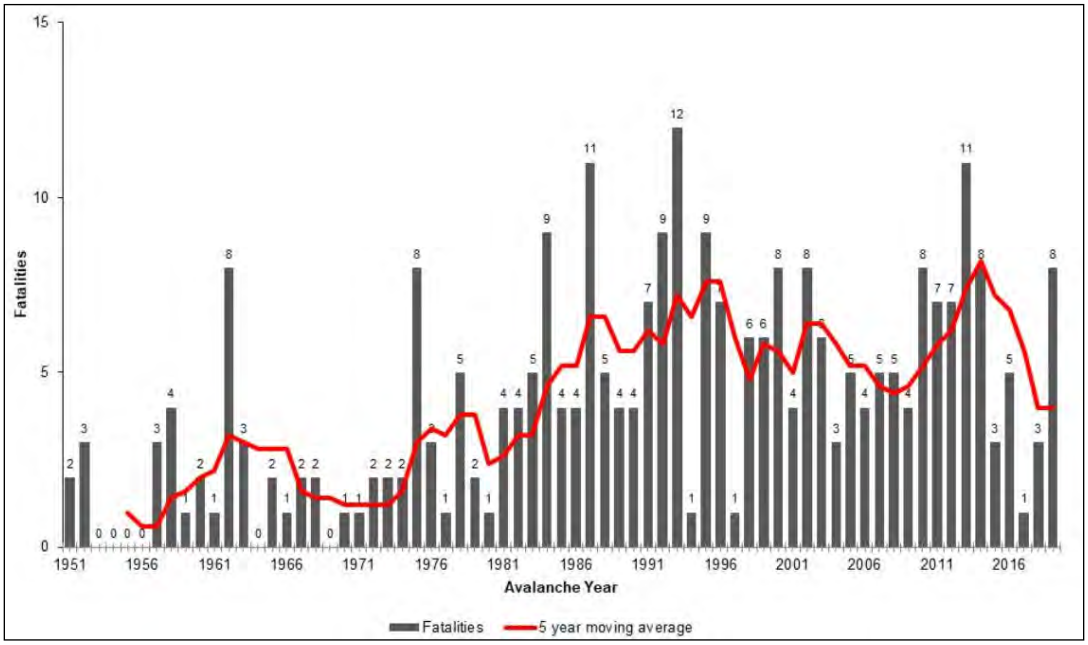
Jurisdiction	Property Type	Total Properties	Improved Value	Content Value	Total Value	Exposed Population
Unincorporated	Exempt	4	$0	--	$0	--
	Residential	1	$1,864	$932	$2,796	3
TOTAL		**5**	**$1,864**	**$932**	**$2,796**	**3**

Source: Summit County GIS and Assessor's Office, CAIC, U.S Census, Wood Analysis

People

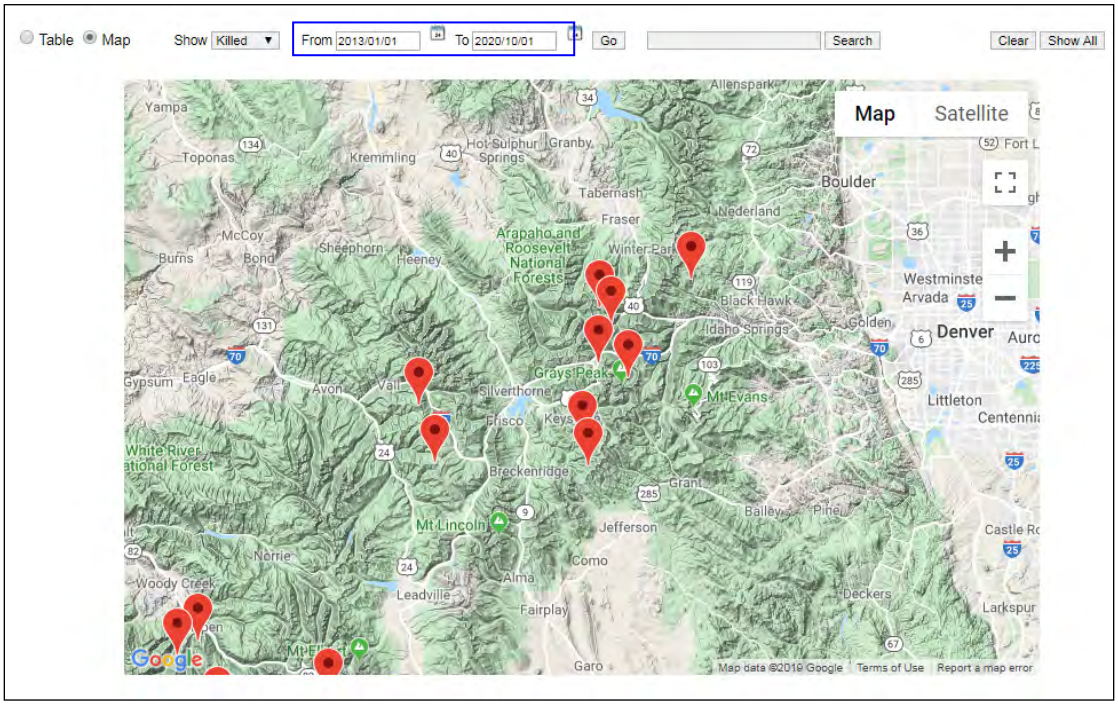
Summit County is susceptible to avalanche-related injuries and fatalities due to the high recreational use of backcountry areas. Backcountry recreationalists, skiers, snowshoers, road crews, and motorists along steep mountain roads are the most at risk to avalanche dangers. Backcountry avalanche incidents involve search and rescue teams and resources, which can put these personnel in areas of risk. Between 1987 and 2013, avalanches caused 10 injuries and 15 deaths in Summit County alone. Since 2013, over 20 additional deaths have been recorded across the entire state due to avalanches (as summarized in Figure 3-41 and shown in map form in Figure 3-42), but it is estimated that some of those deaths (around 6 at least) occurred in the Planning Area. Thus, there is a very high chance that avalanche-related injuries or deaths will occur in any given year. Figure 3-43, Figure 3-44, and Figure 3-45 additionally portray fatality-related summaries for the U.S. based on year and state, for Colorado based on mountain activity type, and by county based on various years, respectively.

Figure 3-42 Colorado Avalanche Fatalities by Avalanche Year, 1950 to 2019



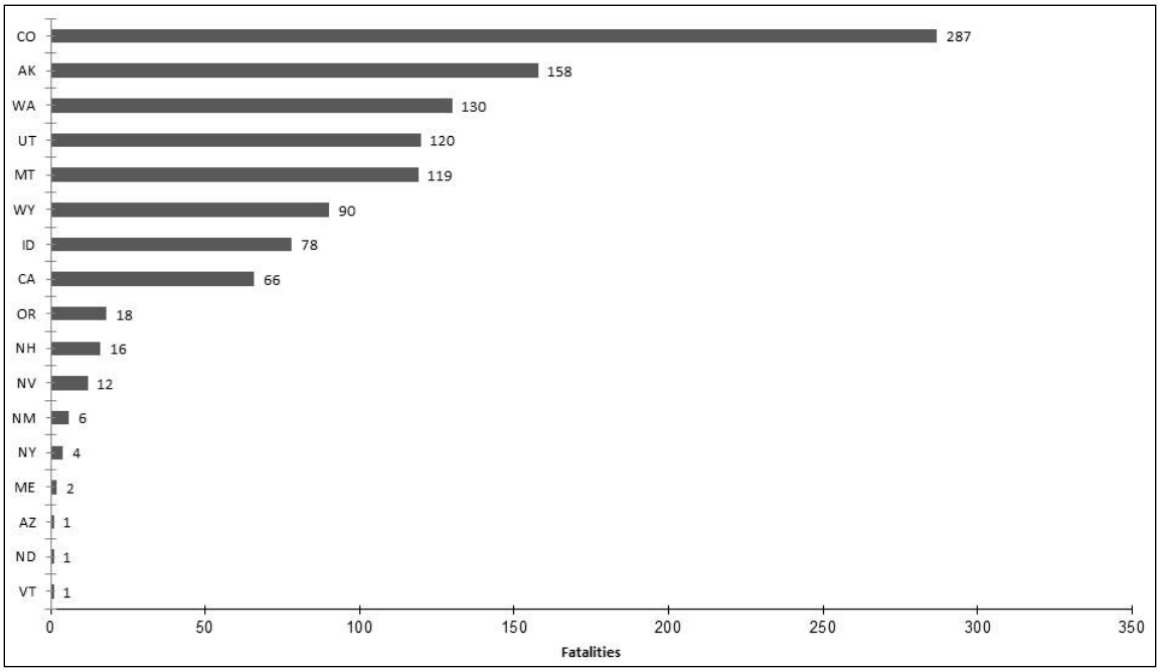
Source: CAIC

Figure 3-43 Avalanche Fatality Locations in and Near Summit County (2013 to 2019)



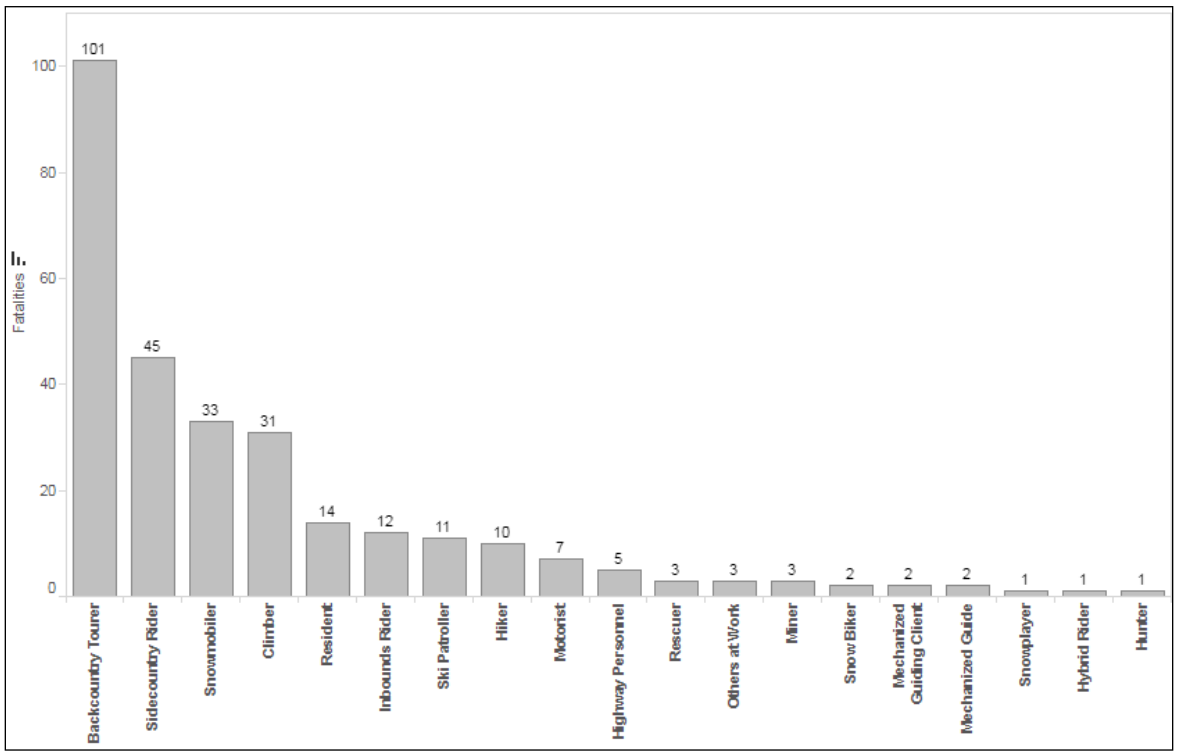
Source: CAIC

Figure 3-44 U.S. Avalanche Fatalities by State, 1950-2019



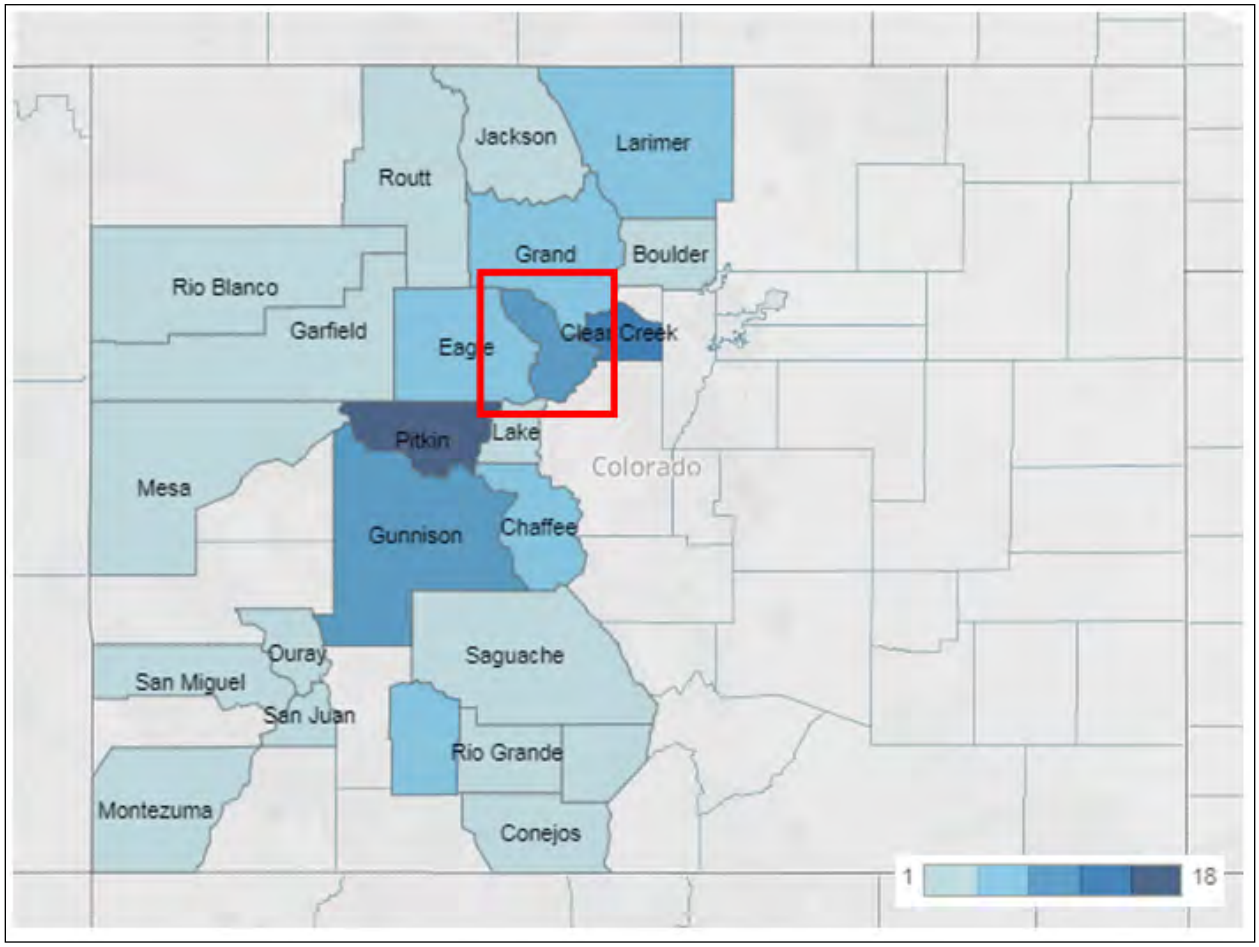
Source: CAIC

Figure 3-45 Avalanche Fatalities in Colorado by Primary Activity, 1951-2019



Source: CAIC

Figure 3-46 Avalanche Fatalities by County in Colorado, 1998-2016



Source: CAIC

Critical Facilities and Infrastructure

The HMPC noted that the utility company Xcel experienced damage to electrical and natural gas lines, poles, and regulators due to avalanche activity in March of 2019. As a result, it became challenging to reach and inspect equipment due to general debris amounts (especially in the Tenmile area in Copper Mountain, near a gas station). Furthermore, Xcel was unable to inspect equipment until they received clearance from the CAIC, which led to employees snowshoeing several miles to reach critical equipment. As a result, Xcel decided to bury utility lines to prevent future incidents of this kind.

The U.S. Forest Service suffered tower damages near Copper Mountain, on State Highway 91.

Past potentially vulnerable critical infrastructure was also noted by the HMPC as being located near U.S. Highway 6 over Loveland Pass, which is also a hazardous materials route. The Colorado Department of Transportation closes Loveland Pass when avalanche conditions are considered too severe. Overall, there are often competing priorities for avalanche induced debris removal.

Based on a GIS analysis using the CAIC provided avalanche paths (current as of December of 2019) and the Summit County critical facility and infrastructure dataset, one structure was found to overlap with

avalanche paths: The Copper Mountain Wastewater Treatment Plant located in unincorporated Summit County. It falls under the Food/Water/Shelter FEMA Lifeline category. Note that the CAIC avalanche path data is limited in the scope of providing where avalanches may actually occur (or where potential for incidents is highly likely, for example), as it only depicts areas where avalanches pose a threat to state and federal highways. Highways at risk include U.S. 6 near Loveland Pass and I-70 in Tenmile Canyon.

Economy

Avalanche activity inside or outside the County (along connecting roadways) can disrupt transportation in and out of the local communities, which could result in temporary economic impacts. Tourism is a main economic driver for Summit County (due to the presence of large and important ski resorts), and a major closure of roads could leave these resorts as well as Summit County residents without access to this vital sector and other necessary resources, potentially hurting the economy of the county and region in a major way.

Historical, Cultural, and Natural Resources

Significant damage has occurred to forests below avalanche runout zones based on past avalanche cycles. Future avalanche activity can also disturb stream habitat with debris piles, and lead to debris removal costs and increased wildlife management costs, for example.

Future Development

The Summit County Countywide Comprehensive Plan discourages building on slopes greater than 30 degrees, but there are not specific avalanche hazard areas identified or mapped. There are no guidelines related to utility lines in avalanche hazard areas.

Risk Summary

- The overall significance rating for Avalanche in Summit County is High.
- Between 1987 and 2019, there were 26 notable avalanches in Summit County (e.g., avalanches that involved injuries or deaths to people, property damages, infrastructure interruptions, or road closures).
- The GIS analysis performed with CAIC avalanche paths and the county parcel layer yielded that 3 Exempt properties are exposed to these avalanche paths. However, no improvement values were available for these.
- 1 critical facility (the Copper Mountain Wastewater Treatment Plant) was found within avalanche paths, in the unincorporated portions of the County.
- Past avalanches have led to road and highway closures, and damaged power transmission lines and other facilities and infrastructure deemed as critical.
- *Related hazards*: Severe winter storm, landslide/mudflow/debris flow/rockfall, dam incidents, flood.

Dam Incidents

There are 8 high hazard, 4 significant hazard, and 2 low hazard dams located in Summit County. A dam failure could result in impacts greater than the 100-year flood event and could be catastrophic. In addition, there are 3 mine tailings storage facilities also classified as dams that could compromise the health as well as safety of those communities and assets downstream, due to potential toxic sludge releases and debris flows of hazardous materials. Associated water quality and health concerns could also

be an issue. Secondary losses would include loss of the multi-use functions of the dam itself and associated revenues that accompany those functions.

GIS analysis was carried out using dam inundation extents available for several dams, to overlay each dam inundation layer with the parcel and critical facility layers in the county to arrive at estimated units and populations at risk. The results of the analyses are explained in more detail below.

General Property

The Summit County Office of Emergency Management has copies of Emergency Action Plans (EAPs) for all high and significant hazard dams in the County; these are available upon request for inspection by FEMA and the Colorado Division of Homeland Security and Emergency Management on a need to know basis. Due to ongoing security concerns of the dam operators and the sensitive nature of the documents, the EAPs and inundation maps are not available for public inspection or release. Therefore, structures and potential loss estimates in the county are based on approximate estimates for some of the dams present countywide and are provided in Table 3-33 and Table 3-34 below.

The total properties at risk and their improvements were found by counting the number of parcels intersecting with the dam inundation extents available and summing those improvement values. Content value calculations are based on FEMA Hazus software protocols.

Table 3-36 Dam Inundation Risk to Properties – Estimates by Jurisdiction

Jurisdiction	Total Properties	Improved Value	Content Value	Total Value	Population
Blue River	144	$72,556,720	$36,278,360	$108,835,080	443
Breckenridge	2,022	$1,247,536,953	$697,600,367	$1,945,137,320	5,034
Dillon	74	$39,305,376	$25,256,971	$64,562,347	158
Silverthorne	1,467	$937,143,149	$559,067,811	$1,496,210,960	3,822
Unincorporated	830	$400,288,666	$207,376,084	$607,664,750	2,421
TOTAL	4,537	$2,696,830,864	$1,525,579,592	$4,222,410,456	11,879

Source: Summit County GIS and Assessor's Office, U.S Census, Wood Analysis

Based on the above results, Breckenridge has over 2,000 parcels potentially exposed to dam inundation hazards, followed by Silverthorne (with 1,467 parcels exposed), the unincorporated portions of the county (with 830 parcels), Blue River (with 144 parcels), and the Town of Dillon (with 74 parcels).

The same results by parcel type are summarized in Table 3-34. The table below indicates that Residential properties are at highest risk based on their total counts and total values, followed by Commercial, Exempt, Agricultural, Vacant, and Utilities parcels. The estimated total value exposed to the available dam inundation layers amount to over $4.2 billion based on the available data, which again may be limited in detail and extent.

Table 3-37 Dam Inundation Effects on Parcels – Estimates by Parcel Type

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population
Agricultural	12	$6,624,905	$6,624,905	$13,249,810	--
Commercial	615	$350,479,616	$350,479,616	$700,959,232	--
Exempt	65	$0	--	$0	--
Residential	3,832	$2,334,297,728	$1,167,148,864	$3,501,446,592	11,879
Utilities	1	$884,138	$1,326,207	$2,210,345	--
Vacant	12	$4,544,477	--	$4,544,477	--
TOTAL	4,537	$2,696,830,864	$1,525,579,592	$4,222,410,456	11,879

Source: Summit County, Wood Analysis

Each dam owner is responsible for having an EAP and inundation map for their facility. These documents are regularly updated and shared with Summit County Emergency Management and other governmental entities that have a direct role in emergency response. Emergency Management and response entities use the EAPs and inundation maps when developing response plans. Dam safety and public education information is available on the Summit County Office of Emergency Management website. Questions should be directed to the Office of Emergency Management or the facility owner.

People

Persons located downstream of a dam are at risk of a dam failure, though the level of risk can be tempered by topography, amount of water or material in the reservoir/dam/structure, and time of day of the breach. Injuries and fatalities can occur from debris, drowning, or release of sludge or other hazardous material. People in the inundation area may need to be evacuated, cared for, and possibly permanently relocated. Impacts could include hundreds of evacuations and possibly casualties, depending on the dam involved. Specific population impacts are noted in Table 3-35 and Table 3-36; total people at risk were calculated by multiplying the average number of persons per household in Summit County based on Census estimates (which equals 3.10) times the number of properties where the dam inundation extents were available. An estimated total of 11,879 people could be at risk countywide based on the rough estimation used, though again it is unlikely that all the parcels or properties found to overlap with dam inundation extents will be populated by the total persons estimated or actually affected by a dam failure event simultaneously. This estimate does not account for non-resident or visitor population.

Critical Facilities and Infrastructure

A total dam failure can cause catastrophic impacts to areas downstream of the water body, including critical infrastructure. Any critical asset located under the dam in an inundation area would be susceptible to the impacts of a dam failure. Of particular risk would be roads and bridges that could be vulnerable to washouts, further complicating response and recovery by cutting off impacted areas. Based on the critical facility inventory considered in the updating of this plan and intersected with the dam inundation extents available, 49 critical facilities were found to be at risk. These at risk facilities are listed in the tables below by jurisdiction and critical facility classification as based on the FEMA Lifeline categories (FEMA Community Lifelines, 2019).

Table 3-38 Dam Inundation Effects on Critical Facilities – Estimates by Jurisdiction

Jurisdiction	Total Critical Facilities
Blue River	2
Breckenridge	15
Silverthorne	19
Unincorporated	13
TOTAL	**49**

Source: Summit County, HIFLD, Wood Analysis

Table 3-39 Dam Inundation Effects on Critical Facilities – Estimates by FEMA Lifeline

Type	Total Critical Facilities
Communications	1
Food/Water/Shelter	14
Hazardous Materials	7
Health and Medical	1
Other/Schools	3
Safety and Security	20
Transportation	3
TOTAL	**49**

Source: Summit County, HIFLD, Wood Analysis

Economy

Extensive and long-lasting economic impacts could result from a major dam failure or inundation events, including the long-term loss of water in a reservoir, which may be critical for potable water needs or local wildlife. A major dam failure and loss of water from a key structure could bring about direct business and industry damages and potential indirect disruption of the local economy, and the failure and release of toxic materials such as sludge from tailings dams in the southwest of the county could impact nearby commerce and industries (such as the Climax Mine), and potentially affect important transportation routes enabling business and tourism into the county (e.g. from the nearby railroad or local highways).

Historical, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. Water could erode stream channels and topsoil and cover the environment with debris. For the most part the environment is resilient and would be able to rebound from whatever damages occurred, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would, were a dam to fail and cause downstream inundation that could further erode surfaces or cause scouring of structural foundations. Toxic releases from tailings dams would potentially affect natural resources by degrading their quality and affecting wildlife.

Future Development

Flooding due to a water related dam failure event is likely to exceed the special flood hazard areas regulated through local floodplain ordinances. The County and towns should consider the dam failure hazard when permitting development downstream of the high hazard and significant hazard dams, in particular. Low hazard dams could become significant or high hazard dams if development occurs below them, however. Catastrophic flooding due to a failure of Dillon Reservoir is beyond mitigation capabilities of local land use planning. Regular monitoring of dams, exercising and updating of EAPs, and rapid response to problems when detected at dams are ways to mitigate the potential impacts of these rare, but potentially catastrophic, events.

Risk Summary

- The overall significance rating for Dam Failure Incidents in Summit County is Medium.
- Eight high hazard (probable loss of life if failure) dams are located in Summit County, along with 4 significant hazard and 2 low hazard dams.
- The largest three dam structures in terms of maximum storage are the Dillon Dam, Green Mountain Dam, and the Ten Pond #3 Tailing Dams. Goose Pasture Tarn is another dam of concern due to its potential to affect Breckenridge. Failure of any of these could result in catastrophic flooding or toxic sludge releases (with the tailing structure).
- Breckenridge and Silverthorne have the largest population at risk to a dam failure, but Blue River and the unincorporated portions of the county also have potential population and property at risk.
- New development in dam inundation areas increases risk and may cause dam hazard rankings to change.
- *Related hazards*: Flood, hazardous material release, landslide/mudflow/debris flow/rockfall, earthquake.

Drought

The majority of past disaster declarations are related to drought, which indicates the County's vulnerability to this hazard. Previous multi-year droughts have left areas more prone to beetle kill and associated wildfires. Other past impacts of drought have included degradation of air quality due to dust, reduction of tourism and recreation activities, and damage to the ranching economy in the Lower Blue Basin. The economy of Summit County, which is largely based upon the ski industry and other outdoor recreation and tourism, is vulnerable to drought conditions.

The 2018 Colorado Drought Plan's drought vulnerability study states that "Counties with the largest rates of growing populations coupled with lack of economic diversification are most vulnerable during drought. The most vulnerable county is Routt, followed by mountain counties such as Eagle, Pitkin, Summit, and Grand, and others throughout the State." The study also observes that while ski resorts such as those in Summit County can be affected by drought, their overall vulnerability is relatively low due to their adaptive capacities, such as diversified offerings at ski resorts. While most large ski resorts do have snowmaking capability for dry years, snow generation can require millions of gallons of water annually. Ski resorts have rights for this water but their ability to divert water can be limited by instream flow rights during drought. The impact to specific resorts will vary by location and depending on where diversions occur relative to other rights. Some resorts may not be impacted at all during drought but can still be hurt

by public perception of ski conditions. A widely publicized drought can keep visitation down regardless of actual conditions.

A decline in tourism and agricultural revenues could also impact the rest of the County's economy. According to the 2018 State of Colorado Drought Mitigation and Response Plan, "the multiplier effect of decreased business revenue can impact the entire economy. When an individual loses or decreases their income all of the goods and service providers, they usually support will also be impacted" (Annex B, 367).

The 2018 State of Colorado Drought Mitigation and Response Plan evaluated the vulnerability of different sectors to drought for all counties in Colorado. (The evaluation excluded the Municipal and Industrial sector because that sector did not follow standard methodology.) The sector vulnerability scores for Summit County are shown in Table 3-37, along with how the County ranks compared to other Colorado Counties. A score of 3.0 or above means that sector is vulnerable to drought; the only sector in Summit County scoring above 3.0 is socioeconomic. This is largely due to the County's lack of economic diversity and tourism economy base. This includes vulnerability to secondary economic impacts, behavioral health impacts and public health concerns specific to drought.

Table 3-40 Drought Vulnerability Scores by Sector

Sector	Summit County Score	Ranking Out of 64 CO Counties
Socioeconomic	3.40	4th
Recreation	2.16	34th
Agriculture	2.13	42th
Environment	1.67	43rd
State Assets	1.30	64th
Energy	1.00	44th
Average Overall Vulnerability	1.94	48th

Source: 2018 State of Colorado Drought Mitigation and Response Plan

While widespread, the losses associated with drought are often the most difficult to track or quantify. FEMA requires the potential losses to structures to be analyzed, and drought does not normally have a structural impact. A notable exception is the potential for drought to exacerbate the landslide hazard along Green Mountain Reservoir due to reduced water levels; this has resulted in damaged homes in the past. The other significant impacts from drought will be on agriculture, wildland fire protection, municipal usage, commerce, tourism and ski industry, and wildlife preservation. The County's economy is largely dependent on tourism, recreation and, to a lesser extent, agriculture. A lack of precipitation can impact skiing, fishing, hunting and more. Drought can also exacerbate the potential occurrence and intensity of wildland fires. The wildland areas of the County have seen an increase in dry fuels, beetle kill and some loss of tourism revenue during the ski season. Water supply issues for domestic needs will be less of a concern for the entire County during droughts since it is offset somewhat by the abundance of water resources and large reservoirs in the County.

General Property

Direct structural damage from drought is rare, though it can happen as noted in the previous paragraph. Drought can affect soil shrinking and swelling cycles and can result in cracked foundations and infrastructure damage.

People

The historical and potential impacts of drought on populations include agricultural and recreation/tourism sector job loss, secondary economic losses to local businesses and public recreational resources, increased cost to local and state government for large-scale water acquisition and delivery, and water rationing and water wells running dry for individuals and families. Other public health issues can include impaired drinking water quality, increased incidence of mosquito-borne illness, an increase in wildlife-human confrontations and respiratory complications as a result of declined air quality in times of drought.

Critical Facilities and Infrastructure

Due to the long-lasting nature of the hazard, the biggest impact of drought is on water supply. As a result, critical facilities that rely on a steady supply of water could see the greatest impacts if a long-term drought occurred. Drought can also directly impact water storage, treatment and distribution systems.

Economy

Summit County's reliance on tourism and the recreation sector as the main economic base make it particularly vulnerable to the effects of drought. Wildlife viewing, hunting and fishing activities have been impacted in past drought events by lower production and requirement numbers and by animals moving away from traditional viewing and hunting areas due to lack of water, loss of vegetative cover, decreased streamflows, sedimentation and fish decline. Drought also has an impact on camping due to forced closures of campsites and surrounding forest due to wildfires and risk of wildfire and hazardous trees are all exacerbated by drought. Drought impacts on the County's natural environment and the cascading impacts to the recreation sector could lead to less people visiting and spending money in County which could have a negative impact on the entire local economy.

Historical, Cultural, and Natural Resources

Severe, prolonged drought can have a negative impact on the natural environment. Wildlife and natural habitats can be affected, including the shrinkage of habitat, dwindling food supplies and the migration of wildlife to more palatable areas. Prolonged drought can cause poor soil quality and increased soil erosion. One of the prevailing impacts of drought to the natural environment is the increased risk of pest infestations and wildfires that burn larger and more intensely during dry conditions. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Existing Development

Drought normally does not impact structures and can be difficult to identify specific hazard areas. Data is not available to estimate potential losses to structures in identified hazard areas, with the exception of structures located within the Heeney slide area (see Landslide vulnerability discussion) along Green Mountain Reservoir. Many of the towns use public education efforts to encourage water conservation during the summer months.

Future Development

As population grows, so do the water needs for household, commercial, industrial, recreation, and agricultural uses. Vulnerability to drought will increase with these growing demands on existing water

supplies. Future water use planning in Colorado is complex and has to account for increasing population size as well as the potential impacts of climate change.

Most of the jurisdictions in Summit County encourage drought resistant landscaping in their master plans for new development. The County's land use code specifically addresses drought resistant landscaping.

Risk Summary

- Multi-year droughts occur approximately every 10 years on average in Summit County
- Drought can affect both water quantity and quality
- The Socioeconomic and recreation sectors are particularly vulnerable to drought
- Drought increases risk to other hazards, such as erosion and deposition, pest infestation, and wildfire
- *Related hazards*: Wildfire, pest infestation (forest and aquatic), erosion and deposition, lightning

Erosion/Deposition

General Property

Damages to property may occur if streamside property is undercut. Development and construction activities can lead to an erosion event if buildings are placed in areas prone to erosion. Physical loss of land may occur as erosion carries land from one property and deposits it on another.

People

Property owners, farmers, and construction workers are rarely directly impacted by what typically are limited and localized events.

Critical Facilities and Infrastructure

Severe erosion may remove the earth from beneath bridges, roads and foundations of structures adjacent to streams. Erosion can also result in isolated infrastructure damage or failure in the County.

Economy

None or limited loss of facilities or infrastructure function or accessibility and limited uninsured damages.

Historical, Cultural and Natural Resources

This event innately impacts land and water. Earth materials are physically moved from one place to another and under certain circumstances, may be significant. Water quality may be impacted from siltation which can also harm to fish and aquatic vegetation. Major flood events can also lead to increased erosion rates as was witnessed in the 2013 floods along the Colorado Front Range.

Future Development

New development can increase the rate and severity of erosion and deposition through the removal of vegetation, altering natural drainage, increasing impervious surface, and reducing stormwater infiltration. Based on analysis conducted for the 2018 State of Colorado Hazard Mitigation plan, housing development in the County is projected to increase by 49 percent by 2030, leading to an erosion and deposition exposure rating of high. The increased risk of erosion as a result of new development can be minimized through the enforcement of the Chapter 7 of the Summit County's Land Development Code

and the implementation of erosion best management practices to help minimize the impacts of future development.

Risk Summary

- Erosion and deposition are natural processes that are also influenced by human activities
- The County's steep slopes and frequent slide activity causes erosion and deposition issues
- Dust-on-snow can result in early snowmelt leading to impacts to the local economy, lifestyle as well as water quality in the Dillon and Green Mountain Reservoirs.
- Climate Change projects show an increased risk of erosion due to increased intensity of heavy rainstorms and increased frequency of wildfire events.
- *Related Hazards*: Flood, drought, landslide, mudflow/debris flow/rockfall, wildfire, and windstorm

Earthquake

Past impacts due to earthquakes have been minimal and potential magnitude and severity is believed to be low, so the County's overall vulnerability to earthquake is low. However, earthquake loss estimation for the 2019 HMP update utilized FEMA's Hazus 4.2 natural hazard loss estimation software. Hazus is a GIS based, standardized, nationally applicable multi-hazard loss estimation methodology and software. Local, state and federal government officials use Hazus for preparedness, emergency response, and mitigation planning. A level 1 Hazus analysis was performed which estimates damage based on an inventory database compiled at a national level aggregated to Census Tracts. As with any model there are uncertainties and the results should be considered approximate for planning purposes.

To evaluate potential losses associated with earthquake activity in the planning area (i.e. Summit County), a 2,500-year probabilistic scenario for a magnitude 6.0 event was run for the entire County using this Hazus 4.2 version. The 2,500-year scenario represents a worst-case level of shaking that considers multiple faults in the region as displayed and described in more detail under Section 3.2.4. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS). The 2,500-year return period analyzes ground shaking estimates from the various seismic sources in the area with a 2 percent probability of being exceeded in 50 years. The International Building Code uses this level of ground shaking for building design in seismic areas.

Hazus estimates the number of people displaced, the number of buildings and facilities/infrastructure damaged, the number of casualties, and the damage to transportation systems and utilities. Results produced by Hazus are reported by at the census tract level. Note that this version of Hazus (4.2) provides estimates based on U.S. Census data from 2010, and so the mentioned inventory or population results are lower than current inventory.

General Property

The following figure (Figure 3-46) displays the Hazus-derived total losses based on the Summit County census tracts. The potential for the highest losses is in the northern portions of the county, which roughly corresponds with the majority of the Middle Blue River water basin and also includes the Town of Silverthorne. Table 3-38 summarizes the scenario results for Summit County based on various assets assessed.

Figure 3-47 Summit County Hazus 2,500-Year Probabilistic Earthquake Scenario – Total Loss Results by Census Tract

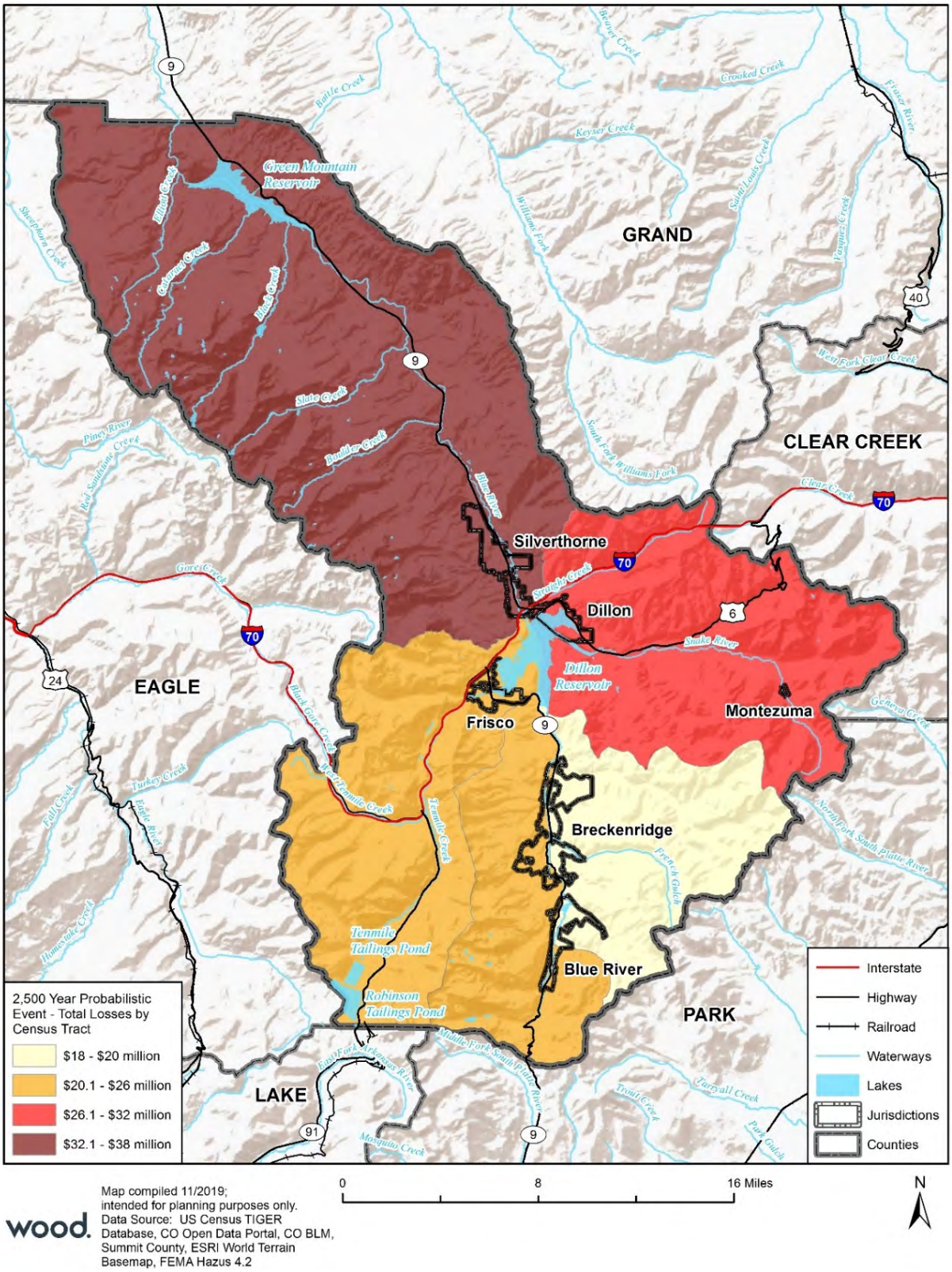


Table 3-41 Earthquake Loss Estimates in Summit County Based on the Hazus 2,500-Year Scenario

Type of Impact	Impacts to County
Total Buildings Damaged	Slight: 2,036 Moderate: 806 Extensive: 138 Complete: 8
Building and Income Related Losses	$137.8 million 78% of damage related to residential structures 15% of loss due to business interruption
Total Economic Losses (includes building, income and lifeline/critical facility losses)	$184.4 million
Casualties (based on 2 a.m. time of occurrence)	Not requiring hospitalization (Level 1): 9 Requiring hospitalization (Level 2): 1 Life threatening (Level 3): 0 Fatalities (Level 4): 0
Casualties (based on 2 p.m. time of occurrence)	Not requiring hospitalization (Level 1): 15 Requiring hospitalization (Level 2): 2 Life threatening (Level 3): 0 Fatalities (Level 4): 0
Casualties (based on 5 p.m. time of occurrence)	Not requiring hospitalization (Level 1): 12 Requiring hospitalization (Level 2): 2 Life threatening (Level 3): 0 Fatalities (Level 4): 0
Damage to Transportation Systems	$450,000 in economic losses to transportation systems (from highway damages and bus facilities)
Damage to Essential Facilities	No damages to essential facilities (which include hospitals, schools, Emergency Operation Centers, Police Stations, and Fire Stations)
Damage to Utility Systems	$46,050,000 in economic losses to utility systems (from potable water, wastewater, natural gas, and communication components)
Households without Power/Water Service (Based on 11,754 Total Households)	No households without power or water service after event
Expected Utility System Pipeline Damages	28 Leaks and 7 Breaks on Potable Water Pipelines 14 Leaks and 3 Breaks on Wastewater Pipelines 5 Leaks and 1 Break on Natural Gas Pipelines 0 Leaks and 0 Breaks on Oil Pipelines
Displaced Households	49
Persons Seeking Temporary Shelter	24
Debris Generation	30,000 tons

Source: Wood analysis with FEMA Hazus 4.2 for Earthquake

The results of the earthquake scenario analysis show moderate damages and losses, especially with regards to economic losses from building, income, and lifeline or critical facilities.

According to this probabilistic scenario, the majority of properties affected are expected of be residential in nature (about 78% of the total number of buildings damaged across the county).

Much of the County's development has occurred more recently and building codes are in place, which reduce the risk of structural damage. Historic buildings constructed of unreinforced masonry are most vulnerable to seismic ground shaking. Downtown Breckenridge is one of the areas most vulnerable to a seismic event in Summit County due to the historic buildings and population center. The HMPC also discussed a "subgrade" water treatment plant in Breckenridge that may be vulnerable to seismic events.

Other potential impacts of an earthquake in Summit County could include secondary effects such as landslides, avalanches (if during winter), wildfire from broken utility or power lines, seiches, or dam failure.

People

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates that 49 households will be displaced due to the earthquake, and 24 people will seek temporary shelter in public shelters.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking. Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four severity levels that describe the extent of the injuries. The levels are described as follows:

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

The casualty estimates are provided for three times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is at its maximum. The 2:00 PM estimate considers that the educational, commercial and industrial sector loads are at their maximum. The 5:00 PM represents peak commute time. There were no fatalities or major injuries in any of the three scenarios, though risk to populations would be highest from a 2 p.m. modeled scenario (as this scenario yields 15 minor injuries and 2 hospitalizations).

Critical Facilities and Infrastructure

General Critical Facility Inventory: Hazus breaks critical facilities into several groups. For the purposes of this particular scenario, the following types of facilities will be discussed: essential facilities, transportation systems, and utility system lifelines.

*Essential Facility Damage***:** Essential facilities include hospitals (0 in the region based on Hazus inventory), schools (9 in the region based on Hazus inventory), fire stations (7 in the region based on Hazus inventory), police stations (5 in the region based on Hazus inventory), and emergency operation center facilities (0 in the region based on Hazus inventory). The model did not result in expected damages to this critical facility category from the earthquake event.

Transportation Systems Inventory: There are 7 transportation systems that include highways, railways, light rail, bus, ports, ferry, and airports; the replacement value for this critical facility category would be around $822.8 million. This inventory includes over 96.31 miles of highways, and 48 bridges. The transportation systems inventory related expected damages from the earthquake would be relatively low, at $450,000.

Utility Lifeline Systems Inventory: There are 6 utility systems that include over 4,419 miles of the following (in pipeline/linear length): potable water, wastewater, natural gas, crude & refined oil, electric power, and communications lines. The replacement value of the utility lifeline systems is estimated to be $724 million. The expected utility system facility damages in terms of economic losses in millions of dollars are summarized in Table 3-39 below. Site specific expected utility system pipeline damages (including their inventory) are included in Table 3-40. The model did not predict potable water and electric power system performance limitations or damages in terms of household availability.

Table 3-42 Utility System Economic Losses in Millions of Dollars

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	64.6020	5.3019	8.21
	Distribution Lines	71.1271	0.1241	0.17
	Subtotal	**135.7291**	**5.4260**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	516.8160	40.5139	7.84
	Distribution Lines	42.6763	0.0623	0.15
	Subtotal	**559.4923**	**40.5762**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	28.4509	0.0214	0.08
	Subtotal	**28.4509**	**0.0214**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.2910	0.0254	8.73
	Subtotal	**0.2910**	**0.0254**	
	Total	**723.96**	**46.05**	

Source: Hazus 4.2

Table 3-43 Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	2,210	28	7
Waste Water	1,326	14	3
Natural Gas	884	5	1
Oil	0	0	0

Source: Hazus 4.2

Economy

Hazus estimates the long-term economic impacts to the region. The model quantifies this information in terms of income and employment changes within the region. The total economic loss estimated for the earthquake is $184.4 million, which includes building and lifeline related losses based on the region's available inventory.

Since the building losses are broken into two categories (of direct building losses compared to business interruption losses), building related losses, which summarize estimates costs to fix or replace structures and damages to properties and their contents are discussed in more detail in the General Property section of this chapter. The estimated losses related to the business interruption of the region (Summit County) were 15% of the specific building-related losses (which amounted to $137.9 million).

However, business interruption losses are summarized in more detail below (Table 3-41). They included the temporary living expenses for people displaced from their homes because of the earthquake event.

Table 3-44 Business-Related Economic Loss Estimates in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.4791	2.4024	0.0567	0.1285	3.0667
	Capital-Related	0.0000	0.2046	2.6416	0.0325	0.0205	2.8992
	Rental	1.3176	2.5060	1.3641	0.0219	0.0670	5.2766
	Relocation	4.6824	1.8602	1.8583	0.1846	0.3717	8.9572
	Subtotal	**6.0000**	**5.0499**	**8.2664**	**0.2957**	**0.5877**	**20.1997**
Capital Stock Losses							
	Structural	7.3938	3.8863	2.2381	0.3904	0.3945	14.3031
	Non_Structural	31.1578	30.9373	7.5005	1.6805	1.3107	72.5868
	Content	13.4901	10.0959	4.8520	1.0866	0.9116	30.4362
	Inventory	0.0000	0.0000	0.1274	0.2028	0.0168	0.3470
	Subtotal	**52.0417**	**44.9195**	**14.7180**	**3.3603**	**2.6336**	**117.6731**
	Total	**58.04**	**49.97**	**22.98**	**3.66**	**3.22**	**137.87**

Source: Hazus 4.2

Historical, Cultural, and Natural Resources

Earthquake effects on the environment, natural resources, and historic and cultural assets could be very destructive depending on the type of seismic activity experienced and secondary/cascading effects from seismic activity (e.g. wildfire). The biggest impacts would likely be on older historic properties in towns like Breckenridge, which may contain vulnerable structures such as wooden or unreinforced masonry buildings.

Future Development

All jurisdictions within the County have adopted building codes. Building codes substantially reduce the potential for loss of life from earthquakes, as they help reduce the amount of damages to future structures by introducing strict requirements, indirectly helping safeguard the populations in or near those structures. Continued growth of population in the County could potentially expose more people to earthquakes and their related hazards, though again this hazard was deemed to pose an overall Low Significance in the county.

Risk Summary

- The overall significance rating for Earthquake in Summit County is Low.
- Around 951 buildings are expected to incur at least moderate damage in the 2,500-year probabilistic earthquake scenario.
- Total economic losses could exceed $184.4 million.
- The building and income related losses are estimated to be $137.8 million, with 78% of the damages impacting residential structures, and 15% of losses being tied to business interruptions.
- Utility systems would experience over $46 million in damages or losses, but transportation systems would only suffer about $450,000 in damages. No essential facilities such as schools or police stations would suffer damages, however.
- No major casualties are expected from the modeled scenario, but a potential 49 households could be displaced, and 24 persons may seek temporary shelter due to this earthquake event.
- *Related hazards*: Landslide/mudflow/debris flow/rockfall, avalanche, wildfire, dam incidents, hazardous material release.

Flood

Flood hazards affect most of the communities in the County, will continue to occur in the future, and can be critical in their magnitude causing injuries or even deaths, and damaging property and infrastructure. The following sub-sections discuss the results of the parcel analysis conducted for Summit County, using parcel centroids and the latest FEMA National Flood Hazard Layer (NFHL) data, updated as of July 17, 2019.

General Property

Vulnerability to flooding was determined by summing potential losses to Summit County's properties in GIS, by using the latest FEMA NFHL data along with the Summit County parcel layer the provided by the Assessor's Office. FEMA's NFHL data depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events. Flood zones A, AE, AH and AO are variations of the 1% annual chance event and

were included in the analysis. The "Shaded Zone X" along with the subtype 0.2% annual chance hazard zone were used to represent the 500-year flood event.

GIS was used to create a centroid, or point, representing the center of each parcel polygon. Only parcels with improvement values greater than zero were used in the analysis (with the exception of "Exempt" parcels, which were included regardless of improvement values); this assumes that improved parcels have a structure of some type. The FEMA flood zones were overlaid in GIS on the parcel centroid data to identify structures that would likely be inundated during a 1% annual chance or 0.2% annual chance flood event. Property improvement values for the points were based on the assessor's parcel data and summed by parcel type and jurisdiction across the county.

Results of the overlay analysis are summarized in Table 3-42 and Table 3-43, first by jurisdiction and flood zone, and then by property type. Contents values were estimated as a percentage of property improvement values based on their occupancy type, using FEMA Hazus guidance as follows: a) Commercial parcels received content values worth 100% of their improvements; b) Residential parcels received content values worth 50% of their improvements; and, c) Exempt and Vacant parcels received content values worth 0% of their improvements. Property improvements and content values were then totaled, and a 25% loss estimation factor was applied based on those totals, per the FEMA depth damage functions.

There are 284 improved properties in the 1% annual chance flood zone. The total property exposure (actual building value plus content value estimate) in that flood zone is $280.2 million, with a loss estimate of $70 million. In the 0.2% annual chance flood there are 24 properties, with a total exposure value of $19.4 million and a loss estimate of $4.8 million additional for that zone.

Based on this analysis, the greatest potential losses from either 100-year or 500-year flooding would occur in unincorporated Summit County (with roughly 145 properties), followed by Frisco (with 87 properties), Silverthorne (with 38 properties), Breckenridge (with 37 properties), and Blue River (with 1 property). Neither Dillon nor Montezuma have special flood hazard areas identified by the NFIP. Overall, there are a total of 308 parcels at risk, with a total value of $299.6 million and a loss estimate of $74.9 countywide.

Table 3-45 Summary of Improved Parcels Vulnerable to Flood by Jurisdiction and Flood Type

Jurisdiction	Flood Zone	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population
Blue River	100-year	1	$942,742	$471,371	$1,414,113	$353,528	3
TOTAL		**1**	**$942,742**	**$471,371**	**$1,414,113**	**$353,528**	**3**
Breckenridge	100-year	32	$30,019,320	$15,009,660	$45,028,980	$11,257,245	87
	500-year	5	$4,314,256	$2,157,128	$6,471,384	$1,617,846	16
TOTAL		**37**	**$34,333,576**	**$17,166,788**	**$51,500,364**	**$12,875,091**	**102**
Frisco	100-year	83	$41,134,967	$21,233,063	$62,368,030	$15,592,008	223
	500-year	4	$1,485,274	$742,637	$2,227,911	$556,978	12
TOTAL		**87**	**$42,620,241**	**$21,975,700**	**$64,595,941**	**$16,148,985**	**236**
Silverthorne	100-year	30	$10,879,487	$5,578,095	$16,457,582	$4,114,395	68
	500-year	8	$2,930,406	$1,187,803	$4,118,209	$1,029,552	16
TOTAL		**38**	**$13,809,893**	**$6,765,898**	**$20,575,791**	**$5,143,948**	**84**
Unincorporated	100-year	138	$95,520,569	$59,427,545	$154,948,114	$38,737,028	307
	500-year	7	$4,375,437	$2,187,719	$6,563,156	$1,640,789	22
TOTAL		**145**	**$99,896,006**	**$61,615,263**	**$161,511,269**	**$40,377,817**	**329**
GRAND TOTAL		**308**	**$191,602,458**	**$107,995,020**	**$299,597,478**	**$74,899,369**	**753**

Source: Summit County, FEMA NFHL, U.S. Census Bureau, Wood analysis

Table 3-46 Summary of Improved Parcels Vulnerable to Flood by Property Type

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population
Commercial	37	$24,942,993	$24,942,993	$49,885,986	$12,471,497	--
Exempt	25	$0	--	$0	$0	--
Residential	243	$166,104,053	$83,052,027	$249,156,080	$62,289,020	753
Vacant	3	$555,412	--	$555,412	$138,853	--
TOTAL	**308**	**$191,602,458**	**$107,995,020**	**$299,597,478**	**$74,899,369**	**753**

Source: Summit County, FEMA NFHL, U.S. Census Bureau, Wood analysis

The loss estimates for this vulnerability assessment are a planning level analysis suitable for flood risk mitigation, emergency preparedness, and response and recovery. The methodology and results should be considered approximate. Uncertainties are inherent in any loss estimation methodology, and losses will vary depending on the magnitude of the flood event. Other limitations may include incomplete or inaccurate inventories of the built environment, lack of mitigation information regarding built structures (e.g. structure elevation details), or even potential mitigation projects in place such as flood control projects. As such, this loss estimation assumes no mitigation and does not account for buildings that may have been elevated above the 1% annual chance event according to local floodplain management regulations. Another limitation to this analysis is that flooding does occur outside of available mapped floodplains due to poor drainage, stormwater overflow, and lack of FEMA or other data for those areas adjacent to streams that have not been analyzed.

People

The population exposed to the flood hazards described in the flood vulnerability analysis was estimated by applying an average household size factor (based on 2018 U.S, Census estimates for Summit County, which equal to 3.1 persons per household) to the number of improved properties identified in the flood hazard areas. Note that only those parcels of type Residential were used to estimate populations exposed. These estimates yielded the population exposures shown in the tables above (Table 3-41 and Table 3-42). As such, the 1% annual chance flood would potentially displace 688 people, and a 0.2% flood would displace an additional 65 people for a total of 753 potential people at risk between both flood hazard areas.

Critical Facilities and Infrastructure

A similar analysis was performed in GIS with flood hazard areas to identify critical facilities at risk. Critical facility data was obtained from Summit County and verified against Homeland Infrastructure Foundation-Level Data (HIFLD) layers. This analysis indicated that a total of 7 facilities are located within the 1% annual chance zone, but all of these were either dry hydrants or water draft points for firefighting. Two structures in the 0.2% annual chance flood zones include the JSA Wastewater Treatment Plant and USFS Dillon Ranger District Office. These are summarized in the table below.

Table 3-47 Critical Facilities Vulnerable to Flood by FEMA Lifeline and Facility Type

Flood Event	Jurisdiction	FEMA Lifeline Category	Critical Facility Type	Total Critical Facilities
100-year	Unincorporated	Food/Water/Shelter	Static Water Structures*	7
TOTAL				**7**
500-year	Silverthorne	Food/Water/Shelter	Wastewater Facilities	1
		Safety and Security	Government Buildings	1
TOTAL				**2**
GRAND TOTAL				**9**

Source: Summit County, FEMA NFHL, HIFLD, Wood analysis; *These are all dry hydrants or draft points.

Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, and other downtime costs. Flooding often coincides with the busy summer tourism months in Summit County, and may impact, directly or indirectly (such as from the negative perception of potential danger to his hazard), the revenues of tourist agencies, hotel bookings, outdoor activity companies, and other such businesses in the commercial and industrial sectors.

Historical, Cultural, and Natural Resources

There are significant historic, cultural, and natural resources and assets located throughout the County (e.g. ski/bike resorts, trails and natural spaces, reservoirs and lakes). Natural areas within the floodplain often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters. Natural resources are generally resistant to flooding except where natural landscapes and soil compositions have been altered for human development or after periods of previous disasters such as drought and fire. 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 which may have

recently suffered from wildfire damage may erode because of flooding, which can permanently alter an ecological system.

National Flood Insurance Program and Policies Analysis

Table 3-45 below provides detailed information on National Flood Insurance Program (NFIP) policies in the county jurisdictions in as well as the unincorporated Summit County.

Table 3-48 Community Participation in the NFIP and Community Rating System

Jurisdiction	Date Joined	Effective FIRM Date	Policies in Force	Insurance in Force ($)	Number of Claims	Claims Totals ($)	Community Rating System Rating
Blue River	-	11/16/2018 (does not participate)	-	-	-	-	-
Breckenridge	06/04/1980	11/16/2018	54	$14,357,000	1	$28,060	-
Dillon	-	No SFHA identified	-	-	-	-	-
Frisco	05/15/1980	11/16/2018	224	$50,108,100	2	$921	8
Montezuma	-	No SFHA identified	-	-	-	-	-
Silverthorne	05/01/1980	11/16/2018	45	$14,395,900	0	$0	8
Summit County*	12/16/1980	11/16/2018	93	$26,471,900	9	$14,818	-

Source: National Flood Insurance Program Community Information System reports, 2019
*Unincorporated areas

NFIP insurance data indicates that as of September 12, 2019, there were 416 total flood insurance policies in force in the County (incorporated jurisdictions plus the unincorporated areas), with $105,332,900 of combined coverage. Flood insurance coverage has gone down from the 458 policies when this plan was updated in 2013. There have been 12 claims for flood losses totaling $43,799.

There were no repetitive losses or severe repetitive losses in Summit County at the time of this plan's update.

Future Development

The risk of flooding to future development should be minimized by the floodplain management programs of the County and its municipalities, if properly enforced. Risk could be further reduced by strengthening floodplain ordinances and floodplain management programs beyond minimum NFIP requirements, such as aiming to increase a municipality's Community Rating System (CRS). For example, the Town of Frisco and the Town of Silverthorne had, as of May 1, 2019, a CRS rating of 8, which qualify the jurisdictions for a special flood hazard area discount of 10%. Some of the reservoirs in the planning area provide only incidental flood protection, but projects such as the improvements to the Blue River Middle Branch channel can help reduce flood potential in developed areas. See Section 3.2.6 for more details on flood hazards and flood protection measures in Summit County.

Risk Summary

- The overall significance rating for Flood in Summit County is High.
- The most people and property at risk to flooding are located in unincorporated areas of the County followed by Frisco, Silverthorne, and Breckenridge.
- There are two critical facilities identified to fall in the 500-year floodplain, but only dry-hydrants in the 100-year floodplain.
- There are currently, as of 2019, around $26.4 million in flood insurance in force for a total of 93 NFIP policies across Summit County and its jurisdictions.
- *Related hazards*: Dam incidents, avalanche, landslide/mudflow/debris flow/rockfall, pest infestation (forest and aquatic), severe winter weather.

Hazardous Materials Release

General Property

The impact of most fixed facility incidents is typically localized to the property where the incident occurs. The impact of small spills during transportation may also be limited to the extent of the spill and remediated if needed. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to property.

People

Hazardous materials incidents impact on people is highly dependent on the location of the incident, but can cause injuries, hospitalizations, and even fatalities to people nearby. People living near hazardous facilities and along transportation routes may be at a higher risk of exposure, particularly those living or working downstream and downwind from such facilities. For example, a toxic spill or a release of an airborne chemical near a populated area can lead to significant evacuations and have a high potential for loss of life.

Critical Facilities and Infrastructure

Impacts of hazardous material incidents on critical facilities are most often limited to the area or facility where they occurred, such as at a transit station, airport, fire station, hospital, or railroad. However, they can cause long-term traffic delays and road closures resulting in major delays in the movement of goods and services. These impacts can spread beyond the planning area to affect neighboring counties, or vice-versa. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to critical facilities.

Economy

The primary economic impact of hazardous material incidents results from lost business, delayed deliveries, property damage, and potential contamination. Large and publicized hazardous material-related events can deter tourists and recreationists and could potentially discourage residents and businesses. Economic effects from major transportation corridor closures can be significant, particularly to tourism and recreation based businesses.

Even small incidents have cleanup and disposal costs, and for a larger scale incident, these could be extensive and protracted. Evacuations can disrupt home and business activities. Large-scale incidents can easily reach $1 million or more in direct damages, with clean-ups that can last for years.

According to one study for the Colorado Department of Transportation, Risk Analysis Study of Hazardous Materials Trucks through Eisenhower/Johnson Memorial Tunnels, a hazardous materials incident on U.S. 6 would result in roadway damage with a replacement cost of approximately $5.5 million per mile. It is also possible that adjacent buildings and other infrastructure in Keystone, the Arapahoe Basin ski area, and Dillon could be damaged in an explosion or spreading fire caused by a hazardous materials incident. The Snake River and Dillon Reservoir are also at risk. The Colorado Department of Transportation estimates that 150 hazardous materials trucks travel along Loveland Pass each day.

Historical, Cultural, and Natural Resources

Hazardous material incidents may affect a small area at a regulated facility or cover a large area outside such a facility. Widespread effects occur when hazards contaminate the groundwater and eventually the municipal water supply, or they migrate to a major waterway or aquifer. Impacts on wildlife and natural resources can also be significant. Releases from abandoned mines in the County have the potential to affect streams and water supplies, but the probability of such an event is unknown.

Future Development

The amount of hazardous materials that are stored, used, and transported across the county are not anticipated to increase over the next five years based on regional growth trends.

Risk Summary

- There were 170 hazardous materials incidents reported between 1990 and 2018, an average of 5-6 per year. The majority of these were related to gasoline and diesel fuel spills resulting from an accident and had limited impact.
- Only 28 of those incidents resulted in any injuries, fatalities, property damage, or evacuations.
- Interstate 70 between the Eisenhower tunnel and Silverthorne is a primary concern when Loveland Pass is closed, and hazardous materials vehicles are escorted through the tunnel
- Other areas of concern are Highway 9 near Green Mountain Reservoir and Highway 6 near Dillon, Keystone, and Arapahoe Basin ski area
- Streams and reservoirs are also vulnerable to contamination from spills and mine releases
- There are no facilities classified as Risk Management Plan facilities, and 17 tier II facilities.
- *Related Hazards*: Severe winter weather, windstorm, landslide, mudflow/debris fall, rockfall

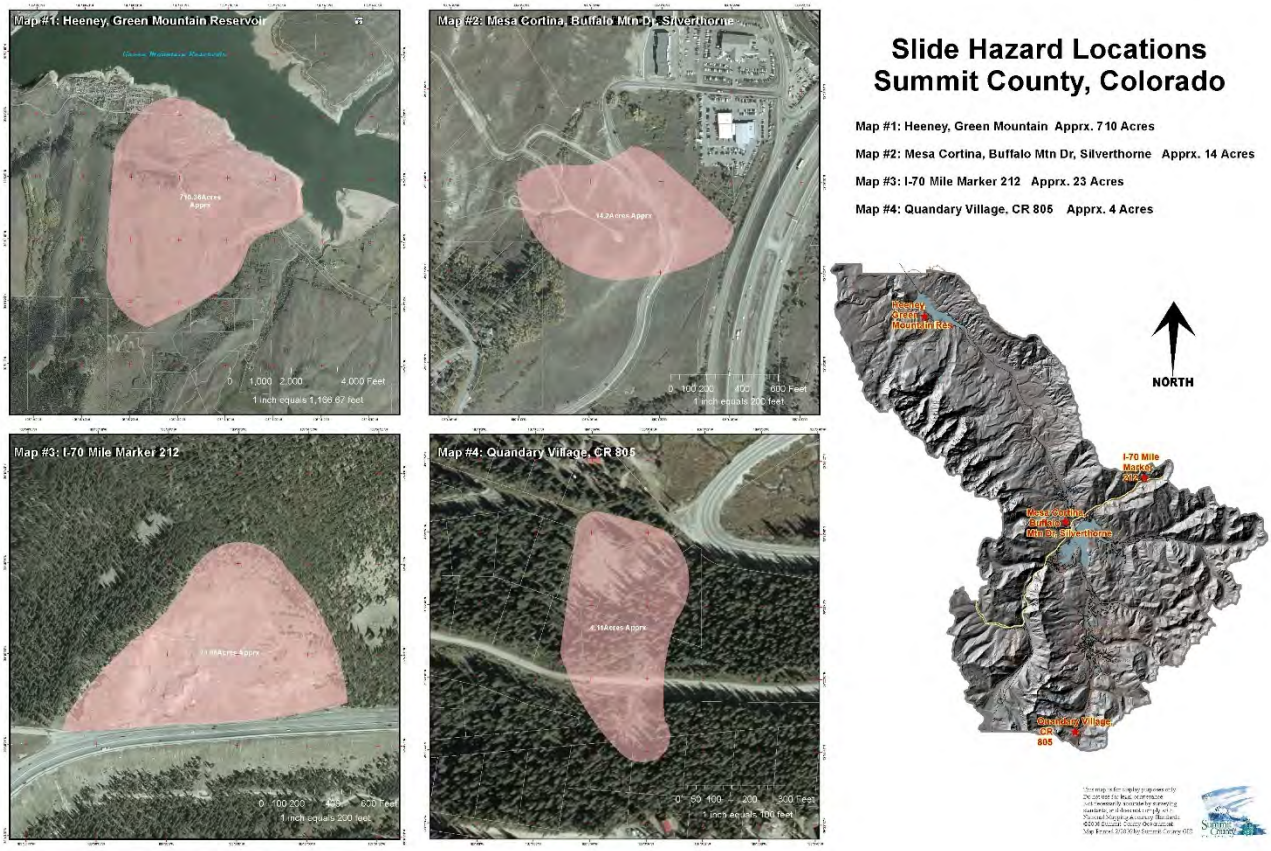
Landslide, Mudflow/Debris Fall, Rock Fall

In Summit County, vulnerability to landslides primarily occurs along roadways, where the hazard could cause injuries or even deaths. Landslides and related hazards (mudflows, debris falls, rock falls) can also flow into rivers and streams, degrading water quality or potentially creating a natural dam failure hazard that would impact property and life safety. Past landslides in the County have threatened or broken water, gas, and power lines. Road closures due to landslide events also affect the County economically.

Notable landslide hazard areas are described in more detail herein. For example, one area of particular concern and where previous closures were required is Interstate 70 near mile marker 212, as illustrated in

Section 3.2.8 as well as in Figure 3-47 below. Landslides in neighboring counties along major highways that carry traffic into Summit County also impact the County indirectly. The primary areas vulnerable to known active landslides are shown in detail in Figure 3-47.

Figure 3-48 Landslide Hazards in Summit County



Source: Summit County

General Property

Potential losses for general landslide hazard areas as well as these four special slide zones were estimated using Summit County GIS and assessor's data and were examined in terms of values and critical facilities at risk. As with previous hazard overlay analysis, GIS was used to create a centroid representing the center of each parcel polygon, which was overlaid on the landslide hazard polygons. The assessor's improved values for each parcel are linked to the parcel centroids. For the purposes of this analysis, if the parcel's centroid intersects the landslide hazard polygons, that parcel is assumed to be at risk. From the improvement values were the content values calculated next, as a percentage of property improvement values based on their occupancy type (using FEMA Hazus guidance as follows): a) Agricultural and Commercial parcels received content values worth 100% of their improvements; b) Residential parcels received content values worth 50% of their improvements; and, c) Exempt and Vacant parcels received content values worth 0% of their improvements. Property improvements and content values were then totaled to arrive at the Total Value column.

Two landslide hazard analyses were completed: the first uses the best available hazard data to date (as of November 2019), based on the Colorado Geological Survey (CGS) landslide areas as utilized in the 2018 Colorado State Hazard Mitigation Plan Update. A more detailed analysis then takes into account the special landslide hazard areas displayed in Figure 3-20 under Section 3.2.8 as well as in Figure 3-47 above.

The results of the first overlay analysis using the general landslide hazard areas provided by the CGS are presented in Table 3-46 and Table 3-47, first by jurisdiction and then by property type. More detailed results are provided in the jurisdictional annexes. If a jurisdiction is not included in the table, then it was not found to have quantifiable assets at risk. While the results indicate a substantial amount of exposure to the hazard particularly in the unincorporated areas of the county, followed by Silverthorne, a more detailed, site-specific analysis would need to be conducted to further assess potential risk. The CGS is currently (as of November 2019) working on an updated version of the landslide hazard layer for areas such as Summit County, so newer data may be available in the future. In many cases landslide issues may have been mitigated during construction. The Towns of Breckenridge, Blue River, and Montezuma are exposed to landslide hazards as well but to a more minor extent, as summarized in the table below.

Table 3-49 Property Exposure to Landslide by Jurisdiction

Jurisdiction	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Blue River	26	$23,906,229	$11,953,115	$35,859,344	81
Breckenridge	44	$73,013,286	$36,506,643	$109,519,929	136
Montezuma	5	$885,825	$442,913	$1,328,738	6
Silverthorne	268	$217,456,668	$109,768,690	$327,225,358	806
Unincorporated	929	$626,016,170	$318,960,305	$944,976,475	2,740
TOTAL	**1,272**	**$941,278,178**	**$477,631,665**	**$1,418,909,843**	**3,770**

Source: Summit County GIS/Assessor Office, Colorado Geological Survey, U.S. Census, Wood analysis

Table 3-50 Property Exposure to Landslide by Property Type

Jurisdiction	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Agricultural	13	$2,222,896	$2,222,896	$4,445,792	--
Commercial	28	$12,117,116	$12,117,116	$24,234,232	--
Exempt	8	$0	--	$0	--
Residential	1,216	$926,583,305	$463,291,653	$1,389,874,958	3,770
Vacant	7	$354,861	--	$354,861	--
TOTAL	**1,272**	**$941,278,178**	**$477,631,665**	**$1,418,909,843**	**3,770**

Source: Summit County GIS/Assessor Office, Colorado Geological Survey, U.S. Census, Wood analysis

The GIS portion of the analysis considering the landslide problem areas of I-70 Mile Marker 212, Heeney, Mesa Cortina, and Quandary Village are provided in Table 3-48 below. Based on this analysis, the landslide hazard at Heeney poses the largest threat to Summit County. That landslide polygon intersects 59 parcels (56 residential and 3 Vacant property) that have a total property value of $19.8 million ($13.3 million in improvement value and $6.5 million in content value). No other special slide area intersects with parcels.

Table 3-51 Property Exposure to Special Slide Hazard Areas by Jurisdiction

Slide Hazard Location	Jurisdiction	Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population
Heeney, Green Mountain Reservoir	Unincorporated	Residential	56	$13,087,516	$6,543,758	$19,631,274	174
		Vacant	3	$193,015	--	$193,015	--
TOTAL			**59**	**$13,280,531**	**$6,543,758**	**$19,824,289**	**174**

Source: Summit County GIS/Assessor Office, U.S. Census, Wood analysis

People

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways. Based on Tables 35, 36 and 37 above, an estimated 3,770 people are potentially exposed to general landslide hazards (Table 3-48 and Table 3-49) in the entire county, and 174 would be exposed to special slide hazard areas. At-risk population was estimated by multiplying the average number of persons living in each household in Summit County (which is 3.1 per home) times the number of properties of type "residential" where landslide areas have been inventoried.

Critical Facilities and Infrastructure

There are 11 critical facilities located in general landslide hazard areas, as summarized in Table 3-49. However, only 1 critical facility is located in special slide areas, specifically within the Mesa Cortina/Buffalo Mountain Drive area in Silverthorne. This is a Fire Lookout Location which is classified under the Safety and Security category per FEMA Lifelines.

Table 3-52 Critical Facilities in Landslide Hazard Areas

Jurisdiction	FEMA Lifeline Category	Critical Facility Type	Total Facilities
Blue River	Food/Water/Shelter	Static Water Structures	1
TOTAL			**1**
Unincorporated	Communications	Public Safety Transmitters	1
	Food/Water/Shelter	Wastewater Facilities	1
	Hazardous Materials	HazMat Tier II SARA Facilities	1
	Health and Medical	Medical Facilities	1
	Safety and Security	Fire Lookout Locations	5
	Transportation	Helipads	1
TOTAL			**10**
GRAND TOTAL			**11**

Source: Summit County, CGS, HIFLD, Wood analysis

Economy

Economic impacts typically center around transportation routes temporarily closed by debris flow, mudflow, or landslide activity. These roads may be used to transport goods across the county or provide access to visitors, which may be unavailable if roads are closed and hence reduce the amount of tourist spending on hotels, resorts, outdoor sports, and other local activities. Depending on the amount of

damage, the road may simply need to be cleaned off, or may require some level of reconstruction and affect the local economy indirectly.

Historical, Cultural, and Natural Resources

As primarily natural processes, landslides and debris flows can have varying impacts to the natural environment; debris flows have the potential to permanently alter the natural landscape. The potential for landslide dams is real across Colorado, as evidenced by the presence of slide hazard areas which have formed important lake systems (e.g. Lake San Cristobal in Hinsdale County). Lakes that form behind landslides can potentially cause flooding downstream should the natural dam be overtopped or blown out by the pressure of the impounded water.

Future Development

The severity of landslide problems is directly related to the extent of human activity in hazard areas. Adverse effects can be mitigated by early recognition and avoiding incompatible land uses in these areas, or by corrective engineering. The mountainous topography of the County presents considerable constraints to development, most commonly in the form of steep sloped areas. These areas (defined as having a grade change of 30% or more) are vulnerable to disturbance and can become unstable. Hence, developing in landslide prone areas can lead to higher hazard vulnerability which may be reduced by applying proper land use and building codes, as well as by introducing mitigation to prevent future damages, losses, and potential injuries or deaths from exposed populations.

Landslide hazard areas were, as of November of 2019, going through study and mapping updates in Summit County which should be available for review in upcoming months, as reported by recent Colorado Geological Survey (CGS) communications (CGS, 2019). Improving mapping and information on landslide hazards and incorporating this information into the development review process could prevent siting of structures and infrastructure in identified hazard areas and refine the vulnerability (or lack thereof) to people, property, and critical infrastructure. Summit County and the towns of Breckenridge, Dillon, Frisco, and Silverthorne have policies in their master plans and/or development codes requiring mitigation through engineering for construction on slopes of a certain steepness and prohibiting development on slopes over 30%.

The Summit County Building Department reviews development applications in the Heeney area and explains hazards present to all applicants. Applicants are required to sign a document similar to a liability waiver and meet strict engineering standards if they choose to build in the known landslide hazard area.

Risk Summary

- The overall significance rating for Landslide/Mudflow/Debris Fall/Rock Fall in Summit County is Medium.
- Potential landslide hazard areas are located throughout Summit County, with four special slide hazard zones: I-70 near mile marker 212; Heeney by the Green Mountain Reservoir; Mesa Cortina/Buffalo Mountain Dr. in Silverthorne; and the Quandary Village, near State highway 80. The Heeney area has the largest property at risk, however, based on the parcel analysis conducted with GIS.
- The parcel analysis with general landslide potential areas yielded 1,272 properties intersect with landslide potential areas, with $1.4 billion in structures and 3,770 people exposed.
- The parcel analysis with the special slide areas yielded 59 properties intersect with these four areas, with $19.8 million in structures and 174 people exposed.

- The critical facility analysis shows that 11 facilities are exposed to the general landslide areas, and only 1 critical facility falls within the special slide hazard areas.
- A slump on Interstate 70 west of the Eisenhower tunnel could create significant impacts, such as closing the highway and affecting nearby water resources.
- *Related hazards*: Erosion/deposition, flood, avalanche, earthquake, dam incidents, hazardous material release, wildfire, windstorm, severe winter weather.

Lightning

General Property

Lightning in particular can cause deaths, injuries, and property damage, including damage to buildings, communications systems, power lines, and electrical systems. Lightning strikes cause intense but localized damage. Structural fires, localized damage to buildings, damage to electrical powerlines and communications outages are typical consequences of a lightning strike.

People

Damaging lightning events are likely to occur and can be critical if a fatality occurs. Outdoor recreationists and others outside at high altitude during summer months are vulnerable to lightning. Exposure is the greatest danger to people from severe thunderstorms. Tourists and those enjoying the outdoors who are not familiar with the severe weather events in the County are particularly at risk of being struck by lightning.

Aspects of the population who rely on constant, uninterrupted electrical supplies may have a greater, indirect vulnerability to lightning. As a group, the elderly or disabled, especially those with home health care services relying on rely heavily on an uninterrupted source of electricity. Resident populations in nursing homes, residential facilities, or other special needs housing may also be vulnerable if electrical outages are prolonged. If they do not have a back-up power source, rural residents and agricultural operations reliant on electricity for heating, cooling, and water supplies are also especially vulnerable to power outages.

The U.S. Department of Health and Human Services ePOWER Mapping tool (https://empowermap.hhs.gov/) provides information on Medicare beneficiaries who rely on electricity-dependent medical equipment such as ventilators to live independently in their homes. According to the tool there are 3,290 Medicare Beneficiaries located in Summit County; of these individuals, 11% (approximately 362 persons) rely on electricity-dependent medical equipment, such as ventilators to live independently in their homes, making them more vulnerable to power outages as a result a lightning event.

Critical Facilities and Infrastructure

The HMPC is also concerned about the impacts lightning can have on the County's power grid and information technology network. Failure of these systems would have cascading effects that would disrupt other critical infrastructure in the County, such as water treatment facilities. Damage to communications infrastructure has the potential to cause widespread impacts.

Economy

Economic impact of a lightning event is typically isolated and short term. Lightning events can cause power outages and fires. Generally, long-term economic impacts center more around hazards that cascade from a severe thunderstorm, including wildfires ignited by lightning, and flooding (refer to the Wildfire and Flood sections). In general, lighting a risk to the tourism economy in the county. These events can disrupt travel into and out of all areas of the county and create perilous conditions for residents, tourists and nature alike.

Historical, Cultural, and Natural Resources

Environmental impacts include the sparking of potentially destructive wildfires by lightning which could affect some natural, historic and cultural resources.

Future Development

New critical facilities, such as communication towers should be built to withstand lighting damage. Development trends in the County are not expected to increase overall vulnerability to the hazard but all development will be affected by lightning and any population growth will increase potential exposure to hazards such as lightning.

Risk Summary

- Lightning-caused deaths (2) and injuries (15) have occurred in Summit County in the past
- Outdoor recreationists at high altitude during summer months are very vulnerable to lightning
- Lightning can damage power grid and information technology and communications networks
- Lightning events have led to $20,000 in property damages in the past 31 years
- *Related Hazards*: Wildfire, drought

Pest Infestation (Forest and Aquatic)

General Property

The impacts to general property and the built environment due to forest pests are generally indirect. Bark beetles specifically have shown to have an impact on fuel structure and increased risk of wildfire. For example, dead needles have a lower moisture content compared to green needles and typically play a role in crown fires. Approximately five years after mortality, the standing dead trees become markedly susceptible to falling and being blown down. This creates a hazard to lives and property near inhabited areas, travel corridors, and recreation areas.

Aquatic nuisance species have a direct impact on water infrastructure for municipal, agricultural and industrial purposes by attaching, clogging, and impairing water storage and distribution systems.

People

Impacts to people as a result of the pest infestation are generally indirect. In Summit County, pest infestations, both the kind of forest and aquatic, can impact the same areas used for recreational activities, and could possibly limit access to certain areas of the forest or limiting allowed activities on the County's reservoirs. Both the Dillon Reservoir and the Green Mountain Reservoir store water to benefit not only

Summit County but much of the Front Range. Aquatic nuisance species such as the quagga and zebra mussels can have impacts on water infrastructure for communities in Summit County and Denver Water.

Critical Facilities and Infrastructure

The major pest identified in this section with the potential to impact critical infrastructure is the quagga/zebra mussel. As noted above, in large concentrations, zebra mussels can accumulate in waterways, clogging pipes and damaging equipment used for drinking water and irrigation.

As discussed previously, tree mortality can exacerbate the impacts of other hazards; dead trees can accelerate the spread of wildfire, adding to the vulnerability of infrastructure. The hazard to power lines from beetle impact forests merits specific attention. Power lines are dispersed throughout Colorado's forests, and the clearance around these lines is typically inadequate to address the threat of large scale mortality. Contact between power lines and trees has caused several fires in recent years and creates the potential for local power outages.

Economy

Many visitors and tourists come to Summit County for recreational purposes and to enjoy the forested areas and the reservoirs. A healthy forest is good for the local economy. The spruce forests which are threatened by the beetles identified in the plan tend to be the same areas used for recreational activities. Lodgepole pines located on the lower slopes of ski areas that may be lost due to infestation can cause wind scouring to become more pronounced on ski runs, requiring increased snow fencing and other mitigative efforts to prevent loss of cover.

Historical, Cultural, and Natural Resources

The forest pests identified in this plan are all native to Colorado. Despite this, an epidemic of the beetle infestation can have impacts to forests. For example, many of the spruce forests being attacked by the spruce beetle are located at the headwaters of the Colorado River. Spruce forests also provide important habitats for several types of species including the boreal toad, Colorado's most at risk amphibian. Tree mortality as a result of infestation raises the wildfire threat in healthy forests, increasing the vulnerability, strength, speed and destruction of fires in the area.

Aquatic invasive species, such as the quagga and zebra mussels typically harm native species through predation, habitat degradation and competition for shared resources; they can muscle native species out of natural habitats and are a leading cause of population decline and extinction in animals.

Future Development

Most likely, good development practices in the future would not have an impact on the planning area's vulnerability to forest and aquatic pest infestations.

Risk Summary

- Quagga mussels were identified in the Green Mountain Reservoir in 2017 and thought to also pose a threat to the Dillon Reservoir.
- Spruce beetles have surpassed the damage caused statewide by the mountain pine beetle, infesting 1.84 million spruce trees between 2000 and 2018.

- Pine needle scale is persistent along the I-70 corridor and has been identified within the Town of Breckenridge
- The infestation is likely to significantly affect forest ecosystems, the economy, and wildfire risk.
- Climate change is projected to increase likelihood of infestations of both native and invasive species.
- *Related Hazards:* Drought, wildfire, lighting, avalanche and windstorm

Severe Winter Weather

General Property

Structural losses to buildings are possible and structural damage from winter storms in Colorado have resulted from severe snow loads on rooftops. Fall and spring snowstorms generally bring heavy and wet snow which impacts utilities, structures and even trees. Occasionally buildings and decks collapse from heavy snow loads. This occurred during the 2010-2011 winter when the Christy Sports shop in Frisco had a roof collapse. Vulnerability is influenced both by architecture and type of construction material and should be assessed on a building-by-building basis. "Roof avalanches" are a possibility after heavy snowfall events although it is uncommon, it has occurred in other mountain communities in Colorado.

It is difficult to identify specific winter weather hazard areas within Summit County. Data was not available to identify specific structures at risk or estimate potential losses to these structures. NCEI data did not provide enough details on past damages and casualties to perform an average annual loss assessment.

People

In the alpine environment of Summit County, severe winter weather occurs several times every season. The County is more vulnerable to the impacts of natural hazards during the winter months due to the increased volume of people living, working, and visiting here. The threat to public safety is typically the greatest concern when it comes to impacts of winter storms. While virtually all aspects of the population are vulnerable to the potential indirect impacts of a winter storm, others may be more vulnerable, such as the elderly and individuals with access and functional needs, particularly if there is a loss of electrical power. As noted under the Lighting Vulnerability Assessment section, 11% of Medicare Beneficiaries (approximately 362 persons) living in Summit County depend on electricity for their medical equipment, such as ventilator in order to live independently.

The weight of heavy continued snowfall and/or ice accumulating on power lines often brings them to the ground causing service disruptions for thousands of customers. This can cause a loss of community water and sewer services, as well as the supply of gasoline, as these services almost always require electrical pumps. In addition, prolonged power outages can mean loss of food in grocery stores and other facilities such has restaurants.

The region can experience high winds and drifting snow during winter storms that can occasionally isolate individuals and entire communities and lead to serious damage to infrastructure. Travelers on Interstate 70 and U.S. 6 in the planning area, or particularly along the many remote stretches of road, can become stranded, requiring search and rescue assistance and shelter provisions. Persons that choose to live in these areas are generally self-sufficient or should be prepared to be self-sufficient for at least 72 hours, as government and emergency services may be limited during a severe winter storm.

Critical Facilities and Infrastructure

Vulnerability is high along roadways and mountain passes, particularly on Interstate 70 and U.S. 6, where severe winter weather conditions may cause traffic related deaths and injuries and increase avalanche risk. Road closures due to winter weather conditions also restrict or prevent the movement of people and goods and services (including food and gas), which can be crippling during the high tourism season and create the need for emergency sheltering for travelers. The potential for traffic accidents and multi-vehicle pile ups is a real possibility due to the combination of winter skier traffic and adverse weather.

Economy

Closure of Interstate 70 or U.S. 6 during winter storms could temporarily isolate Summit County and further isolate remote areas of the County. Depending on the length of the closure it could also hinder the local economy which is dependent on tourism and out of county visitors.

Historical, Cultural, and Natural Resources

Natural resources may be damaged by the severe winter weather, including broken trees from avalanches. Unseasonable storms may damage or kill plant and wildlife, which may impact natural food chains until the next growing seasons. Most of these impacts would be short-term. As noted previously, older, historic buildings could potentially be more vulnerable to roof and structural damage from heavy snow.

Future Development

Future residential or commercial buildings built to code should be able to withstand snow loads from severe winter storms. Population growth in the County and growth in visitors will increase problems with road, business, and school closures and increase the need for snow removal and emergency services related to severe winter weather events.

Risk Summary

- There is high vulnerability to severe winter weather along highways and mountain passes
- Increased population exposed to hazards and emergencies during high tourist seasons
- Severe winter weather can isolate residents and travelers by closing roads into and out of the County.
- The County has experienced 82 severe winter weather events in the past 68 years.
- Climate change projections show delays in early snowmaking and ski seasons being cut early due to decreased levels of snowpack, resulting in impacts to the local economy and lifestyle.
- *Related Hazards:* Avalanche, windstorm, hazardous material incidents

Wildfire

Vulnerabilities to wildfire include:

- Structures and private property
- Critical Infrastructure as well as power lines and roadways
- Key Resources and assets such as medical facilities, schools, watersheds, reservoirs, and public/government buildings
- Tourism and habitat resources such as trails, ski resorts, dispersed recreation sites, viewsheds, and wildlife habitat.

The highest potential for negative and even deadly impacts of wildland fire is in the WUI. Every fire season in the United States catastrophic losses from wildfire plague the WUI zones. Homes are damaged or lost, businesses destroyed, community infrastructure damaged, and, most tragically, lives may be lost. Figure 3-48 below shows an example of properties found in the WUI areas in highly forested communities such as Summit County and its jurisdictions.

Figure 3-49 Aerial of the Aftermath of the 2018 Buffalo Mountain Fire – Example of Homes Intermixed in Summit County's Extensive WUI Areas

Source: U.S. Forest Service 2018 Report on The Health of Colorado's Forests

General Property

Potential losses to wildfire were estimated using a countywide wildfire protection assessment area GIS layer which depicts areas exposed to various degrees of wildfire threat (from low to extreme threat), along with assessor's data from Summit County. GIS was used to create a centroid, or point, representing the center of each parcel polygon, which was overlaid on the wildfire layer. For the purposes of this analysis, the wildfire threat zone that intersected the centroid was assigned as the threat zone for the entire parcel. Improvement values were summed by wildfire threat rating area and then sorted by jurisdiction. From the improvement values were calculated as a percentage of property improvement values based on their occupancy type (using FEMA Hazus guidance as follows): a) Agricultural, Natural Resources, and Commercial parcels received content values worth 100% of their improvements; b) Residential parcels received content values worth 50% of their improvements; c) Industrial and Utilities parcels received content values worth 150% of their improvements, and, d) Exempt and Vacant parcels received content values worth 0% of their improvements. Property improvements and content values were then totaled to arrive at the Total Value column. Wildland urban interface fires typically result in complete loss of structures and contents.

The results are shown in Table 3-50 below. Additional information on these analysis results are provided in the respective jurisdictional annexes, as well as town wildfire hazard maps.

The data contains a total exposure value of $20.1 billion, from a total improved value of $12.7 billion and $7.4 billion in content values.

Table 3-53 Property Values in Wildfire Threat Zones by Jurisdiction and Fire Threat Type

Jurisdiction	Wildfire Threat Area	Total Properties	Improved Value	Content Value	Total Value and Loss Estimate (100% of this Total Value)	Population
Blue River	Medium	569	$364,809,264	$182,404,632	$547,213,896	1,758
	High	113	$62,362,002	$31,181,001	$93,543,003	344
	Extreme	11	$8,422,171	$4,211,086	$12,633,257	34
TOTAL		**693**	**$435,593,437**	**$217,796,719**	**$653,390,156**	**2,136**
Breckenridge	Medium	5,960	$4,047,995,578	$2,104,614,848	$6,152,610,426	17,230
	High	64	$57,311,074	$35,294,866	$92,605,940	195
	Extreme	2	$4,502,111	$2,251,056	$6,753,167	6
TOTAL		**6,026**	**$4,109,808,763**	**$2,142,160,769**	**$6,251,969,532**	**17,431**
Dillon	Medium	1,207	$515,687,199	$268,590,230	$784,277,429	3,416
	High	86	$52,916,794	$27,170,914	$80,087,708	260
TOTAL		**1,293**	**$568,603,993**	**$295,761,143**	**$864,365,136**	**3,677**
Frisco	Medium	2,090	$1,126,591,804	$619,327,342	$1,745,919,146	5,586
	High	133	$70,621,590	$36,919,535	$107,541,125	406
TOTAL		**2,223**	**$1,197,213,394**	**$656,246,877**	**$1,853,460,271**	**5,992**
Montezuma	Medium	35	$12,027,591	$6,013,537	$18,041,128	99
	High	21	$8,141,523	$4,070,762	$12,212,285	59
	Extreme	2	$823,911	$411,956	$1,235,867	6
TOTAL		**58**	**$20,993,025**	**$10,496,254**	**$31,489,279**	**164**
Silverthorne	Medium	235	$158,935,230	$101,790,218	$260,725,448	552
TOTAL		**235**	**$158,935,230**	**$101,790,218**	**$260,725,448**	**552**
Unincorporated	Medium	8,677	$5,368,023,629	$3,508,275,307	$8,876,298,936	25,680
	High	1,315	$830,112,204	$420,605,234	$1,250,717,438	3,984
	Extreme	101	$52,019,070	$25,562,712	$77,581,782	295
TOTAL		**10,093**	**$6,250,154,903**	**$3,954,443,252**	**$10,204,598,155**	**29,958**
GRAND TOTAL		**20,621**	**$12,741,302,745**	**$7,378,695,231**	**$20,119,997,976**	**59,911**

Source: Summit County GIS/Assessor Office, Co-WRAP, U.S. Census, Wood analysis

Based on this analysis, unincorporated Summit County has the highest total property value exposed to wildfire threat areas, with roughly $10.2 billion in medium, high, and extreme wildfire threat zones. Breckenridge is the incorporated jurisdiction most at risk to wildfire, with approximately $6.3 billion in medium, high, and extreme wildfire threat zones. Frisco follows in terms of risk, with approximately $1.9 billion in medium to extreme wildfire threat zones. Dillon, Blue River, Silverthorne, and finally Montezuma are next with regards to most total value exposed to wildfire within the medium, high, and extreme threat zones.

Overall, Summit County has $20.1 billion in total property values in medium, high, and extreme wildfire threat zones.

People

The last column of Table 3-50 above summarizes the number of people at risk to wildfire in the analyzed fire threat zones, broken out by jurisdiction. Unincorporated areas of the County have the most people at risk (with 29,958), followed by Breckenridge (with over 17,400), Frisco (with almost 6,000), Dillon (with more than 3,600), Blue River (with over 2,000), Silverthorne (with 552), and Montezuma (with 164 people exposed). These totals were estimated by multiplying the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire threat zones. Overall, the county has an estimated 59,911 people at risk of wildfire hazard based on the analysis and estimation methodology described herein. While this is higher than the actual population, it may also be indicative of the population that surges during the summer season.

In addition, smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

As displayed in Figure 3-49 below, watersheds and power lines are examples of critical assets and infrastructure that Summit County is concerned about being vulnerable to wildfires, based on past experience with fire events.

Figure 3-50 Critical Infrastructure and Key Resources Vulnerable to Wildfire Examples

Table 3-51, Table 3-52 and Table 3-53 list critical facilities identified in wildfire threat areas, based on a GIS overlay analysis which used a county critical facility layer along with the wildfire protection assessment areas. The first (Table 3-51) summarizes the number of facilities at risk based on jurisdiction. Table 3-52 lists the same information, but this time based on FEMA Lifeline Category. Lastly, Table 3-53 summarizes the critical facilities at risk of wildfire threat zones based on the general critical facility type. Overall, there are 122 critical facilities located in medium, high, or extreme wildfire threat areas amongst all

incorporated jurisdictions as well as the unincorporated portions of the county. There are 2 critical facilities in extreme wildfire threat areas, all of which are in unincorporated areas of the County; 19 facilities fall in high fire threat areas; and, 101 are in medium fire threat areas.

Table 3-54 Critical Facilities in Wildfire Threat Areas by Jurisdiction

Jurisdiction	Total Critical Facilities
Blue River	9
Breckenridge	14
Dillon	9
Frisco	8
Montezuma	1
Silverthorne	2
Unincorporated	79
TOTAL	**122**

Source: Summit County/GIS, HIFLD, CO-WRAP, Wood Analysis.

Table 3-55 Critical Facilities in Wildfire Threat Areas by FEMA Lifeline Category

FEMA Lifeline	Total Critical Facilities
Communications	8
Energy	1
Food/Water/Shelter	23
Hazardous Materials	8
Health and Medical	7
Other/Schools	6
Safety and Security	65
TOTAL	**122**

Source: Summit County/GIS, HIFLD, CO-WRAP, Wood Analysis.

Table 3-56 Critical Facilities in Wildfire Threat Areas by Critical Facility Type

Critical Facility Type	Total Critical Facilities
Ambulance Stations	3
Communications/Cell Towers	3
Energy Substations	1
Fire Lookout Locations	21
Fire Station	8
Government Buildings	27
HazMat Tier II SARA Facilities	8
Helipads	4
Incident Facilities	4
Information Centers	1
Medical Facilities	4
Police Stations	5
Public Safety Transmitters	4
Schools	6
Static Water Structures	11
Wastewater Facilities	12
TOTAL	**122**

Source: Summit County/GIS, HIFLD, CO-WRAP, Wood Analysis.

Economy

Tourism, the accommodation and food services industry (e.g. hotels and restaurants), and retail are major components of Summit County's economy. Wildland fires can have a direct impact on recreationally used lands and the County's scenery, adversely affecting the ability of the local populations to earn a living from these industries. For example, fires may lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation. 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.

Historical, Cultural, and Natural Resources

Many historic downtown areas in communities such as Breckenridge or Frisco could be especially vulnerable to wildfires and wind-driven firebrands. In addition, and as previously mentioned with the reliance on tourism and visitation for recreational purposes, environmental and natural landscapes are key resources to the county but may be negatively impacted from wildfires.

Next to people and property, natural resources impacts from wildfires could be severe and widespread. Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the trend for hotter, more widespread and destructive fires can make it more difficult for the environment to recover, and lead to increased flood or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after the fire.

Future Development

Summit County's population has almost tripled since 1990. Much of this growth was in the wildland-urban interface, which has increased the risk that wildfire presents to lives, property, and community resources.

Existing and future development in many areas of the County are vulnerable to wildfire. Summit County and the towns of Breckenridge and Silverthorne have wildfire mitigation regulations in place for new development. The Summit County Community Wildfire Protection Plan (CWPP), which was re-adopted in 2018, lays out a comprehensive set of strategies to address the wildfire issue while individual mitigation projects are being planned and implemented within the identified focus areas. Figure 3-50 shows examples of mitigation activates Summit County has or could carry out in order to reduce wildfire damages in the future. Refer to the capability assessments in the jurisdictions' specific annexes, as well as this CWPP, for further details on wildfire related plans, regulations, and mitigation strategies.

Figure 3-51 Wildfire Mitigation Example Activities

Future development will include the creation of defensible space and fuel breaks around structures as exhibited in this neighborhood scale defensible space in Breckenridge (left) and contour felling of beetle stricken pine as seen in Vail (right).

Risk Summary

- The overall significance rating for Wildfire in Summit County is High.
- About 51% of Summit County acreage is at medium, high, or extreme risk to wildfire based on the wildfire protection assessment threat zones.
- Countywide there is an estimated $18.4 billion in total property value in medium wildfire threat areas; $1.6 billion of total property value is in high wildfire threat areas; $98 million in property value is at exposed to extreme wildfire threat. A total of 20,621 properties were found in these wildfire threat areas, most of which are located in the unincorporated portions of the county.
- A large percentage of the population are exposed to wildfire threats across Summit County.
- Critical roads, including Interstate 70, Highway 6, and Highway 9, are also vulnerable to wildfire
- 122 critical facilities are identified in medium (with 101 facilities exposed), high (with 19 facilities exposed), or extreme (with 2 facilities exposed) wildfire risk areas.
- The unincorporated portions of the county contain the most at-risk critical facilities (with 79), followed by Breckenridge (14), Blue River (9), Dillon (9), Frisco (8), Silverthorne (2), and Montezuma (1).
- *Related hazards*: Earthquake, wildlife-vehicle collisions, drought, dam incidents, landslide/mudflow/debris flow/rockfall.

Windstorm

It is difficult to identify specific windstorm hazard areas within Summit County. Data was not available to identify specific structures at risk or estimate potential losses to these structures. NCEI data did not provide enough details on past damages and casualties to perform an average annual loss assessment. Windstorm has a cascading impact on other hazards addressed in the plan. Windstorm vulnerability is increasing due to the damaged trees from pest infestations. Windstorms also contribute to the erosion hazard and have caused blowing dust during times of drought. Wind also is a major contributing factor to wildfire behavior.

General Property

General damages are both direct (what the wind event physically destroys) and indirect, which focuses on additional costs, damages and losses attributed to secondary hazards spawned by the event, or due to the damages caused by the wind event. Depending on the magnitude of the wind events they are capable of damaging and eventually destroying almost anything. Construction practices and building codes can help maximize the resistance of the structures to damage.

Secondary impacts of damage caused by wind events often result from damage to infrastructure. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a wind event put tremendous strain on a community. In the immediate aftermath, the focus is on emergency services.

People

Community members are the most vulnerable to high wind events. The availability of sheltered locations such as basements, buildings constructed using wind-resistant materials and methods, and public storm shelters, all reduce the exposure of the population. However, there are also segments of the population that are especially exposed to the indirect impacts of high winds, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, and other special needs housing facilities are also vulnerable if electrical outages are prolonged, since backup power generally operates only minimal functions for a short period of time. As noted under the Lighting Vulnerability Assessment section, 11% of Medicare Beneficiaries (approximately 362 persons) living in Summit County depend on electricity for their medical equipment, such as ventilator in order to live independently.

Critical Facilities and Infrastructure

Public gathering places including (but not limited to) schools, community centers, shelters, nursing homes and churches, may have increased impacts at certain times of day if a high wind event was to occur. Due to the random nature of this hazard, a more specific risk assessment was not conducted for this plan.

Economy

Winds typically don't have long-term impacts on the economy. High winds may impact exposed critical infrastructure such as power lines; depending on the impact and the function, this could cause a short-term economic disruption. The most common problems associated with high winds are loss of utilities. Downed power lines can cause power outages, leaving large parts of the County isolated, and without electricity, water, and communication. Damage may also limit timely emergency response and the number

of evacuation routes. Damaging winds can also cause fires, which may start along dry roadside grass vegetation. Downed electrical lines following a storm can also increase the potential for lethal electrical shock.

Historical, Cultural, and Natural Resources

High winds can cause massive damage to the natural environment, uprooting trees and other debris. This is part of a natural process, however, and the environment will return to its original state over time.

Future Development

As the County continues increasing in population, the number of people and housing developments exposed to the hazard increases. Proper education on building techniques and the use of sturdy building materials, basements, attached foundations, and other structural techniques may minimize the property vulnerabilities. Public shelters at parks and open spaces may help reduce the impacts of windstorms on the recreational populations exposed to storms.

Risk Summary

- There have been 56 recorded high wind events in the past 33 years in the County. The highest recorded event was 116 mph in 2005.
- There is growing risk related to blowdown of dead trees which could impact recreational areas and powerline infrastructure.
- 11% of Medicare Beneficiaries (approximately 362 persons) in the County are dependent on electricity to live independently making them highly vulnerable to loss of power.
- *Related Hazards:* Wildfire, erosion and deposition, pest infestation, severe winter weather and avalanche

Wildlife-Vehicle Collisions

General Property

The primary concern associated with wildlife hazards is public safety and to a lesser extent property damage. Wildlife-vehicle collisions caused 521 damages to property between 2005 and 2017. WVCs have resulted in over $30,000 in property damages statewide since 2005.

People

Travelling population in the planning area is at risk to this hazard. Generally, only a few people are affected by a wildlife hazard at any one time, although injuries or death are possible. WVCs have caused 41 injuries and one fatality in Summit County between 2005 and 2017. Wildlife-vehicle collisions average nearly 266 injuries and 3 fatalities per year. Since the installation of two wildlife overpasses and five overpasses on State Highway 9 between Silverthorne and Kremmling CDOT has reported an 87% decrease in WVCs on that stretch of notoriously dangerous road.

Critical Facilities and Infrastructure

It is unlikely that critical facilities and services would be impacted.

Economy

Wildlife-vehicle collisions can temporarily close roads, which can potentially hurt the County's economy during peak tourist seasons. It is estimated that WVCs cost over $60 million to the state economy each year.

Historical, Cultural, and Natural Resources

Between 2014 and 2018 CDOT reported over 8,000 wild animals killed by WVCs throughout Region 3, the highest number of reported roadkill in the five CDOT regions. Statewide nearly 7,000 wild animals were killed in 2016 alone (highest in 2016). Deer and elk represent the majority of species killed by vehicle collision but threatened and endangered species such as lynx have also been reported in Region 3. A disruption in an animal's natural habitat such as a wildfire event or severe winter storm with heavy snow amounts can push wild animals out of the habitats, sometimes from higher to lower elevations leading to an increased risk of WVCs.

Future Development

As population growth continues in the County, increased road development and expansion is likely to follow. Both existing and future development need to take into account the locations of critical wildlife habitats. Wildlife migration corridors should be clearly marked during future development projects to help protect the County's residents, visitors, and wildlife.

Summit County currently has one the highest number of engineered animal crossings in the state with 9 structures. The workgroup Summit County Safe Passages has developed a guiding document that identifies wildlife migratory patterns across the County and prioritizes 17 wildlife linkages that are of high concern based on the type of species impacted and number of WVCs. Based on the prioritization the group provides recommendations for wildlife passage structures including overpasses and underpasses along specific stretches of road. As of October 2019, Summit County government was considering endorsing the plan and taking the wildlife passage corridors into consideration when drafting future updates or amendment to the County's Comprehensive plan or Land Use Code.

Risk Summary

- 563 WVCs took place in Summit County between 2005 and 2017 resulting in 521 incidents of property damage, 41 injuries and 1 fatality.
- CDOT Region 3 (includes Summit County) had the highest number of wildlife animals killed from vehicle collisions, with over 8,000 animals killed in 4 years (2014-2018).
- Summit County averages 47 WVC events per year, and about 3 a year that result in injuries.
- *Related Hazards:* Wildfire, winter weather

4 MITIGATION STRATEGY

44 CFR Requirement 201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy developed by the Summit County Hazard Mitigation Planning Committee (HMPC) based on the County's risk assessment in Chapter 3. The mitigation strategy was developed through a collaborative group process and consists of goals, objectives, and mitigation actions.

- **Goals** are general guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are usually long-term, broad, policy-type statements.
- **Objectives** define strategies or implementation steps to attain the identified goals and are specific and measurable.
- **Mitigation Actions** are specific actions that help achieve goals and objectives.

This section describes how the County accomplished Phase 3 of FEMA's 4-phase guidance-Develop the Mitigation Plan-and includes the following from the 10-step planning process:

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

4.1 Mitigation Strategy Overview

As part of the 2020 plan update process, a comprehensive review and update of the mitigation strategy portion of the plan was conducted by the HMPC. The goals and objectives from the 2013 plan were revisited and reaffirmed. The end result was an updated mitigation strategy that reflects the updated risk assessment, the completion of 2013 actions, and the new priorities of this plan update. Section 4.2 below identifies the current goals and objectives of this plan update, and Section 4.4 details the updated mitigation action plan.

4.2 Goals and Objectives

44 CFR Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

The HMPC developed goals and objectives to provide direction for reducing hazard-related losses in Summit County. These were based upon the results of the risk assessment and a review of goals and objectives from other state and local plans, specifically, the Colorado State Multi-Hazard Mitigation Plan, 2018, Summit County Countywide Comprehensive Plan (2009), Summit County Climate Action Plan (2018) and Summit County Community Wildfire Protection Plan (2013, updated in 2016). This review was to ensure that this plan's mitigation strategy was integrated with existing plans and policies.

The HMPC revisited and re-validated the goals during the 2020 update. Committee members were given the list of goals from the 2013 plan to review, along with the current goals from related plans previously

mentioned. The HMPC was instructed that they could use, combine, or revise the statements they were provided or develop new ones on their own, keeping the risk assessment in mind. The goals and objectives remained largely the same except for a couple minor edits. In Goal 1 the HMPC dropped the word 'natural' and left 'hazards' to reflect that this plan addresses both natural and human-caused hazards. One of the objectives for Goal 1 was clarified to include visitors in addition to residents. Goals and objectives are listed below, but are not prioritized:

Goal 1: Reduce risk to the people, property, and environment of Summit County from the impacts of hazards

- Minimize the vulnerability of existing and new development to hazards
- Increase education and awareness of hazards and risk reduction measures for both residents and visitors to the County
- Improve comprehensive wildfire planning, funding, and mitigation
- Strengthen floodplain management programs

Goal 2: Protect critical facilities and infrastructure

- Enhance assessment of multi-hazard risk to critical facilities and infrastructure
- Prioritize mitigation projects based on the enhanced assessment and identify funding sources
- Reduce hazard related closures of transportation routes

Goal 3: Minimize economic losses

- Strengthen disaster resistance and resiliency of businesses and employers
- Promote and conduct continuity of operations and continuity of governance planning
- Reduce financial exposure of county and municipal governments and special districts

Goal 4: Implement the mitigation actions identified in the plan

- Improve communication and coordination between communities and state and federal agencies
- Engage collaborative partners, including community organizations, businesses, and others
- Integrate mitigation activities into existing and new community plans and policies
- Monitor, evaluate, and update the mitigation plan

4.3 Identification and Analysis of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

A representative from each participating jurisdiction was present at the third meeting of the HMPC to identify and analyze potential mitigation actions. Jurisdictional representatives missing from the third meeting participated through emails and phone calls with the consultant and County Emergency Manager. To identify and analyze potential mitigation actions to achieve the mitigation goals, Wood provided the HMPC with a packet of materials at its third meeting with information on types of mitigation actions, key issues from Chapter 3 Risk Assessment, and a worksheet of the plan's goals and objectives. The group discussed different types of mitigation actions. During both the 2013 and 2020 planning processes, the HMPC was provided with the following list of categories of mitigation actions, which originated from the National Flood Insurance Program's Community Rating System (CRS), as well as definitions and examples for each category:

- **Prevention**: Administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
- **Property protection**: Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.
- **Structural**: Actions that involve the construction of structures to reduce the impact of a hazard.
- **Natural resource protection**: Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- **Emergency services**: Actions that protect people and property during and immediately after a disaster or hazard event.
- **Public information/education and awareness**: Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Next, the HMPC discussed the key issues for each priority hazard that emerged from the Risk Assessment and brainstormed potential mitigation alternatives to address them. To facilitate the brainstorming process, the HMPC discussed a list of potential mitigation alternatives for each of these hazards, which had been prepared by Wood. This list is included in Appendix C. Each HMPC participating jurisdiction was asked to identify at least one new mitigation action that would work toward achieving the plan goals. Each jurisdiction was provided two large post-it notes to write down potential new mitigation actions. Each jurisdiction was then asked to stick their new actions onto flip-chart paper posted on the wall of the meeting room. The result was a capture of potential new mitigation actions, organized by jurisdiction.

Next, the HMPC reviewed each jurisdiction's mitigation ideas and in some cases discussed the potential action further with the larger group. Based upon the key issues identified in the risk assessment, including the existing capabilities of jurisdictions, and the overall political, technical, and financial feasibility of the potential actions, the HMPC came to consensus on new mitigation actions for each jurisdiction. The group then completed a prioritization process for all the newly identified actions, further details on this process can be found in subsection 4.3.1 below.

4.3.1 Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria, and

others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- **Social:** Will the action be acceptable to the community? Could it have an unfair effect on a particular segment of the population?
- **Technical:** Is the action technically feasible? Are there secondary impacts? Does it offer a long-term solution?
- **Administrative:** Are there adequate staffing, funding, and maintenance capabilities to implement the project?
- **Political:** Will there be adequate political and public support for the project?
- **Legal:** Does the jurisdiction have the legal authority to implement the action?
- **Economic:** Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- **Environmental:** Will there be negative environmental consequences from the action? Does it comply with environmental regulations? Is it consistent with community environmental goals?

At its third meeting in 2013 and again in 2019, the HMPC used STAPLEE to determine which of the identified actions were most likely to be implemented and effective. Each member used STAPLEE to identify his or her top four mitigation actions and then voted for these actions by sticking a colored dot on the post-it note on which the action was written. The number of dots next to each action was totaled.

This process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. Emphasis was placed on the importance of a benefit-cost analysis in determining project priority; however, this was not a quantitative analysis. The Disaster Mitigation Act regulations state that benefit-cost review is the primary method by which mitigation projects should be prioritized. Recognizing the federal regulatory requirement to prioritize by benefit-cost, and the need for any publicly funded project to be cost-effective, the HMPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the 2018 State of Colorado Hazard Mitigation Plan. Cost-effectiveness will be considered in additional detail when seeking FEMA mitigation grant funding for eligible projects identified in this plan.

Following the third HMPC meeting in both 2013 and 2019 the representative from each participating jurisdiction coordinated a meeting with his or her jurisdictional planning team to discuss mitigation actions. Using the STAPLEE criteria, the jurisdictional planning teams chose from the mitigation actions those that they wanted to implement in their jurisdiction. They also updated actions from the 2013 plan and identified new actions specific to the risks in their jurisdiction. Appropriate team members were assigned to complete implementation worksheets for each identified action.

4.4 Mitigation Action Plan

44 CFR Requirement §201.6(c)(3)(iii): [The mitigation strategy shall include] an action plan describing how the actions identified in paragraph (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

This section outlines the development of the updated 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.

4.4.1 Progress on Previous Mitigation Actions

During the 2020 update process the HMPC reviewed and evaluated the 2013 mitigation strategy to determine the status of the actions. The purpose of this was to measure progress by determining which actions were completed, and to revisit the remaining items to determine if they should be carried forward or removed from the plan. During this review process previous actions priorities were also reviewed, and many jurisdictions determined that some high priorities could be updated to a low priority in the 2020 plan update. The 2013 mitigation strategy contained 90 separate mitigation actions. In general, the review shows that much progress has been made since the original plan was adopted in 2008 and since the previous update in 2013. Table 4-1 lists over 33 actions from the 2013 plan that have been completed.

Table 4-1 Mitigation Action Progress Summary

Action Status	Count
Completed	33
In Progress	16
Annual Implementation	22
Continue - Not completed	14
Deleted	3

The table below summarizes progress implementing mitigation actions by jurisdiction. Based on the progress made as of the beginning of 2020 the majority of actions identified in the 2008 and 2013 versions of this plan have either been completed, are implemented annually, or are in progress. The Total Continuing Actions column summarizes the actions from 2013 that are either still in progress, have annual implementation, or are continuing but not completed. The New Actions in 2020 summarizes the number of actions that were identified during the 2020 plan update process.

Table 4-2 Mitigation Action Progress Summary by Jurisdiction

Jurisdiction	Completed	In Progress	Annual Implementation	Continue-Not Completed	Deleted	Total Continuing Actions	New Actions in 2020
Multi-Jurisdictional	3	0	3	0	1	3	0
Summit County	9	5	4	1	0	10	8
Blue River	4	1	1	0	0	2	5
Breckenridge	4	0	3	2	0	5	2
Dillon	0	0	1	1	0	2	1
Frisco	1	0	1	0	0	2	2
Silverthorne	6	0	0	2	0	2	1
Montezuma	0	0	0	2	0	2	0
Buffalo Mountain MD	2	0	5	0	0	5	1
Summit Fire & EMS	1	0	0	2	0	2	1
Red, White, and Blue FPD	2	3	2	0	0	5	2
Copper Mountain CMD	0	2	2	0	0	4	1
DVD, EDWD, MCWD, SRWD	0	4	0	0	0	4	3
Hamilton Creek MD	0	1	0	4	0	5	1
Denver Water	1	0	0	2	2	2	2
Grand Total	**33**	**16**	**22**	**14**	**3**	**53**	**29**

More detailed descriptions of those actions follow Table 4-2. Three of the actions in the 2013 HMP have been deleted. The actions that have been deleted are shown in Table 4-3.

Several of these actions have increased the mitigation and response capabilities of the County, and thus will help save lives in future incidents. Implementation of the actions has resulted in greater community awareness of Summit County's vulnerability to natural hazards and reduced vulnerability for hazards such as wildfire and forest pests, such as the mountain pine beetle.

Summit County, in partnership with the Summit County Wildfire Council, has created a sustainable wildfire mitigation funding source and made great strides in fuels reduction projects in an effort to mitigate wildfire hazards. This funding source is a direct result of implementation of Summit County mitigation actions #2 and #3. In 2011 the Summit County Wildfire Council recognized that an unfulfilled funding need existed for projects identified in the Community Wildfire Protection Plan (CWPP) that did not meet the criteria for the State's Hazardous Fuels Reduction Grant Program. That recognition has led to the creation of the CWPP Implementation Grant Program. The County uses this program to provide funds or matching funds to leverage other wildfire mitigation grants. The County maintains an atlas of fuels reduction projects on its wildfire mitigation web page that is updated quarterly so that progress is documented on a regular basis. According to the CWPP, revised in 2016 and re-adopted in 2018, a total of 145 wildfire prevention projects were implemented and 1,907.47 acres treated between 2006 and 2016.

Shortly after this plan was initially completed the County was able to successfully obtain a FEMA Pre-Disaster Mitigation (PDM) Grant for defensible space near Keystone Ski Resort. The grant was awarded to the County in September 2010. Keystone Resort selected a contractor and entered into an additional contract with Summit County to manage the project and all site work. The project resulted in 48 acres of defensible space being created on private property throughout the Keystone Resort. This project was tied into other mitigation projects and resulted in over 3,890 high hazard trees being removed from the forest fuels. Summit County nominated Keystone Resort for the outstanding volunteer recognition award from the Colorado Emergency Management Association for their efforts on the project.

Partnership efforts, including a 900-acre fuel break created by the U.S. Forest Service around a subdivision near Silverthorne and Buffalo Mountain Metropolitan District, have resulted in demonstrated mitigation success within the County. The project was tested in June 2018 and helped to reduce damages from the Buffalo Mountain Fire.

Other mitigation actions have seen much progress and are close to completion. The status of the actions being carried forward from the 2013 plan is included in the more detailed action descriptions that follow Table 4-2 or in the jurisdictional annexes.

During the update and revision to the mitigation strategy the priority of the 2013 actions were revisited. Revised priorities are reflected in Table 4-2. New mitigation actions are also captured in the table and action descriptions in the respective jurisdictional annexes.

4.4.2 Continued Compliance with NFIP

Given the flood hazard and risk in the planning area and recognizing the importance of the NFIP in mitigating flood losses, an emphasis is placed on continued compliance with the NFIP by Summit County and all NFIP participating jurisdictions including Breckenridge, Frisco, and Silverthorne. As NFIP participants, these communities have and will continue to make every effort to remain in good standing with NFIP. This includes continuing to comply with the NFIP's standards for updating and adopting floodplain maps and maintaining and updating the floodplain zoning ordinance. There are several action items identified in Table 4-3 that address specifics related to NFIP continued compliance. Other details related to NFIP participation are discussed in the community capabilities section of each jurisdictional annex and the flood vulnerability discussion in Section 3.3.

4.4.3 Updated Mitigation Action Plan

The new and continuing mitigation actions developed by the HMPC are summarized in Table 4-3. The HMPC came to consensus on which departments and persons are responsible for completing an implementation worksheet for the County for each identified mitigation action. The worksheets document background information, ideas for implementation, lead agency, partners, potential funding, cost

estimates, benefits, and timeline for each identified action. Action details are presented in the respective jurisdictional annex or following Table 4-3 for multi-jurisdictional actions.

Summit County and the towns of Breckenridge, Dillon, Frisco, and Silverthorne all have significant regulatory, personnel, technical, and financial resources and capabilities. The communities have been very proactive about mitigating risk to natural hazards when the need is identified and guiding new development away from hazard areas. Several of the special districts have also been very proactive about mitigating risk to natural hazards. As a result, there are few structural mitigation projects that need to be addressed in these jurisdictions. The mitigation strategy instead focuses on improving communication and coordination within the County and between its jurisdictions to improve efficiency and effectiveness of existing mitigation activities. Many actions are also aimed at additional proactive planning efforts and integrating existing plans to further enhance local capabilities.

The County's highest priority hazard in the mitigation strategy is wildfire. The County and jurisdictions continue to contribute their own resources to education, planning, land use and building regulations, defensible space, and fuel reduction. However, the vulnerability is high and continued resources are required to implement needed loss reduction measures.

Table 4-3 summarizes all of the prioritized mitigation actions and indicates which jurisdictions plan to implement them; it also provides information on the hazards and plan goals addressed. The CRS category was added in 2013 and the action numbers were updated to reflect the current action list. The mitigation action implementation worksheets for multi-jurisdictional actions follow the matrix. The implementation worksheets for each jurisdiction are included in the jurisdiction's annex to the plan.

Table 4-3 Mitigation Action Matrix

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Multi-Jurisdictional—1	Coordinate annual reviews of the Summit County Multi-Hazard Mitigation Plan to monitor, evaluate, and update the plan.	High	Goal 4	Multi-Hazard PR	Annual Implementation	This review occurs as groups meet to review and discuss the hazards with highly likely ratings.
Multi-Jurisdictional—2	Continue public involvement in mitigation activities	High	Goals 1,4	Multi-Hazard PI	Annual Implementation	This action occurs in a number of meetings and venues. Wildfire mitigation received the highest degree of attention with activities organized through the Wildfire Council.
Multi-Jurisdictional—3	Improve coordination of local emergency sheltering plans	High	Goal 1,4	Multi-Hazard, Severe Winter Weather ES	Completed	Shelter plans have been consolidated with the American Red Cross taking the lead for this action.
Multi-Jurisdictional—4	Consolidate fragmented meetings into one public safety meeting and/or stimulate interest in local emergency planning committee (LEPC)	High	Goal 4	Multi-Hazard PR	Completed	This action resulted in the establishment of a single Public Safety Meeting day. As a result, some meetings were consolidated, and scheduling of attendees was improved. The LEPC has been re-established and is meeting on a regular schedule.
Multi-Jurisdictional—5	Coordinate wildland-urban interface policies and programs for improved consistency between the Towns and the County	High	Goal 1,4	Wildfire PR	Annual Implementation	Collaboration between the County and Towns on wildfire concerns is high. We recognize there are structural differences between the County and Town Governments. The

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						County and Towns have uniformly adopted the Fire Code and through Building Codes are supporting wildfire policies such as defensible space.
Multi-Jurisdictional—6	Coordinate County emergency planning with Regulated Entities Emergency Planning and hazard vulnerability assessments (HVA)	Medium	Goal 2	Multi-Hazard PR	Completed	Improved planning continues to take place between facilities required to have emergency action plans and the County, Towns and Special Districts. The formation of the Dillon Dam Security Task Force is an example of this improved level of cooperation.
Summit County—1	Coordinate vulnerable populations plans	High	Goal 1	Multi-Hazard ES	Completed	In 2018 the Local Emergency Planning Committee (LEPC) officially adopted the Community Inclusion Sub-Committee in the bylaws. Additionally, the 2019 draft EOP update contains a new Emergency Support Function specifically dedicated to Access and Functional Needs.
Summit County—2	Support and participate in the Summit County Wildfire Council	High	Goal 1,4	Wildfire PR	Annual Implementation	The Summit County Wildfire Council remains active and continues to administer local wildfire mitigation grants. In 2018 and 2019, voters approved tax measures to continue to fund wildfire prevention strategies, driven by the SCWC's

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						implementation of the CWPP's goals and objectives. The tax measures allocate $500K annually, in perpetuity, and an additional 1M per year for a ten-year period (2018 - 2027). The 27 Focus Areas had 89 action items associated. By 2019, nearly all of the attainable actions have been completed. The SCWC will review and revise the action list to support ongoing community protection from wildfire efforts.
Summit County—3	Integrate wildfire mitigation strategies identified in the Summit County Community Wildfire Protection Plan (CWPP) into the multi-hazard mitigation plan	High	Goal 1,4	Wildfire PR	Annual Implementation	With the 2020 update of the Multi-Hazard Mitigation Plan, the integration of these plans grows stronger. The Summit County Wildfire Council remains active and continues to administer local wildfire mitigation grants.
Summit County—4	Work with the Summit County Forest Health Group (formerly referred to as Mountain Pine Beetle Task Force) to strengthen public and stakeholder educational efforts	High	Goal 1,4	Wildfire PI	Annual Implementation	Stakeholder involvement and participation in the important topic of Wildfire Prevention, Forest Health and Resilience is an ongoing effort. In addition to our connection with the Forest Health Task Force (FHTF), staff actively works with the Summit Association of Realtors (SAR), Open Space and Trails (OST: in the

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						County and Town of Breckenridge), and have partnered with the Treasurer to include wildfire information in the annual Tax Mailer, to name a few. The Summit County Wildfire Council represents a number of additional partners.
Summit County—5	Continue to enhance mapping of hazard and vulnerability analysis for wildland-urban interface areas of Summit County	High	Goal 1	Wildfire PR	Annual Implementation	In 2016, the CWPP received a 10-year update which included a comprehensive review and revision of the CWPP maps. With the addition of a dedicated Colorado State Forest Service (CSFS) staffer in Summit County, all project maps will be filed in a consistent manner and be reflective of projects funded with taxpayer monies.
Summit County—6	Identify and prioritize fuel reduction projects around critical facilities and infrastructure in wildfire hazard areas	High	Goal 2,3	Wildfire PR	Completed - Continuing	This work was completed around schools and the hospital and is in a maintenance condition. As people continue to move into the WUI and development persists, new "critical facilities and infrastructure" warrant wildfire protection attention.
Summit County—7	Review and strengthen floodplain regulations when adopting new digital flood insurance rate maps (DFIRMs)	High	Goal 1	Flood PR	Completed	This action has been completed. Summit County will continue to comply with the NFIP and adopt new

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						State of Colorado floodplain regulations.
Summit County—8	Incorporate information from the multi-hazard mitigation plan into community master plans	Medium	Goal 4	Multi-Hazard PR	In Progress	The Planning Department is continually updating the master plans and incorporates many of the Multi-Hazard Mitigation Plan principles.
Summit County—9	Develop protection plans for roadside ditches to reduce erosion and flooding	Medium	Goal 2	Erosion/ Deposition, Flood PR	In Progress	This has been implemented in select locations where the problem has either been accelerated by storm events or where reconstruction projects have provided an opportunity and will continue to be implemented on future planned projects.
Summit County—10	Enhance flood protection of the Snake River's collection system to prevent potential sanitary sewer overflows or inundation of critical facilities.	Low	Goal 2	Flood PP	Completed	
Summit County—11	Improve education and information on the National Flood Insurance Program (NFIP) and flood hazard areas in Summit County.	Low	Goal 1	Flood PI	In Progress	County had a Community Assistance Visit with FEMA in fall of 2019 and discussed plans to improve our press releases and communication through permit processes. Additional opportunities may yet arise.
Summit County—12	CWPP inclusion of water and utility focused layers	High	Goal 1	Wildfire PR	Completed	Action added in 2013
Summit County—13	Prepare a hazard information and action guide	Medium	Goal 1	Multi-Hazard PI	Completed	Action added in 2013

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Summit County—14	Conduct public education and outreach programs	High	Goal 1	Multi-Hazard PI	Completed	Action added in 2013
Summit County—15	Receive Storm Ready status from the National Weather Service	High	Goal 1	Multi-Hazard PR	Continue – not completed	Action added in 2013
Summit County—16	Expand SCAlert Public Warning Groups	Medium	Goal 1	Multi-Hazard ES	Completed	Action added in 2013. Multiple new groups have been created and thousands of new subscribers have been added.
Summit County—17	Compost for revegetation – created by fuels reduction projects to help mitigate flood damage and erosion/deposition/water quality impacts	High	Goal 1	Erosion/ deposition NR	In progress	Action added in 2013
Summit County—18	Wildfire property protection, structural retrofits, and non-combustible roof replacement program	High	Goal 1, 2	Wildfire PP	Completed	Action added in 2013. In 2019, the Building Code was revised, and adopted by the BOCC, to include WUI standards and the updated IAFC defensible space zones. In 2017, the Land Use and Development Code was revised and adopted to address master plan and subdivision standards as well as materials and landscaping requirements in relation to wildfire prevention.
Summit County—19	All-Hazards Warning System	Medium	Goal 1	Multi-Hazard PI, ES	Completed	Action added in 2013. FEMA approval of IPAWS alert and warning technology approved and implemented in 2018.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Summit County—20	Replace culverts with clear-span structures on Straight Creek and others to reduce or eliminate flood risk.	Low	Goal 1, 2, 3 S, PP	Flood	New in 2020	
Summit County—21	Emergency Power Study and Generator Installation	High	Goal 1, 2, 3 PR, PP, ES	Wildfire, Severe Winter Weather	New in 2020	
Summit County—22	Emergency Shelter Enhancements	Medium	Goal 1 PR, ES	Wildfire, Severe Winter Weather	New in 2020	
Summit County—23	Develop additional fuel breaks for critical infrastructure and evacuation routes	Medium	Goal 1, 2 PR, PP, NR	Wildfire	New in 2020	
Summit County—24	Mitigate areas prone to motor vehicle/hazardous materials transportation accidents.	High	Goal 1, 3 PR, PP, S	Hazardous Materials Incidents	New in 2020	
Summit County—25	Identify abandoned mines for cleanup & hazardous release mitigation.	Medium	Goal 1 NR	Hazardous Materials Incidents	New in 2020	
Summit County—26	Conduct a supply chain study	Medium	Goal 1, 3 PR	Wildfire, Severe Winter Storms, Avalanche, HazMat	New in 2020	
Summit County—27	Water source protection upgrades along Hwy 91, I-70 (Ten Mile Canyon, Officers Gulch)	Low	Goal 1 PR, NR	Wildfire, HazMat, Avalanche, Landslide	New in 2020	
Blue River—1	Replace collapsing culverts and rebuild bridge over the Blue River on Blue River Road.	High	Goal 1, 2	Flood PR	Completed	This is complete and culverts are cleared on an annual basis to ensure functionality
Blue River-—2	Continue homeowner defensible space program begun in 2007	High	Goal 1	Wildfire PR	Annual Implementation	The Town provides funding each year towards the defensible space grant program in conjunction with the Summit County Wildfire Council.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Blue River—3	Regrade Spruce Creek Road to allow safe automobile passage to homes and national forest trails	Low	Goal 1,2	Erosion/ Deposition, Flood PR	Completed	The road was addressed as best as possible given funding and terrain. Safety of this road is addressed in the Blue River Capital Improvement Plan and will be completed as funding is available.
Blue River—4	Augment water supply with new cisterns	High	Goal 1, 2	Wildfire PP	Completed	Action added in 2013. Cisterns have been installed in 21 locations throughout town. As easements are granted and requests submitted, additional cisterns will be installed per the capital improvement plan.
Blue River—5	Develop comprehensive Master Plan	Medium	Goal 1	Multi-Hazard PI	In progress	Action added in 2013. In 2019 the Town completed and adopted the capital improvement plan. This plan is being utilized as a planning document and the town is working towards funding the plan as part of a long term project. In 2020 the Town will be updating the 2014 Comprehensive Plan.
Blue River—6	Realign Spruce Creek Road with Colorado Highway 9	High	Goal 1	Multi-Hazard PR	Completed	Action added in 2013. Safety mirrors are being installed.
Blue River – 7	Develop an Emergency Plan for Highway closures	High	Goal 1	Multi-Hazard PR, ES	New in 2020	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Blue River – 8	Fuels reduction and creation of fuel breaks on the National Forest land and county land that border the Town.	High	Goal 1,2,3	Wildfire PP	New in 2020	
Blue River – 9	Bury utilities throughout Town	Medium	Goal 2	Multi-Hazard PR, PP, S	New in 2020	
Blue River – 10	Complete Capital Improvement Plan projects for roads to improve drainage and avoid flooding risks and road damage.	Medium	Goal 2	Flood PP, S	New in 2020	
Blue River – 11	Develop winter preparedness kits and information for mountain road travel along Hwy 9 and Hoosier Pass	Medium	Goal 1	Severe Winter Weather PR, PI	New in 2020	
Breckenridge—1	Inspect metal culverts to determine risk of failure	High	Goal 1,2	Flood PR	Annual Implementation	Annual Inspection of all Culverts.
Breckenridge—2	Install erosion traps	High	Goal 1,2	Erosion/ Deposition, Flood PR	Annual Implementation	Ongoing as necessary. Erosion traps are installed, and sediment detention improvements completed when necessary.
Breckenridge—3	Promote defensible space and removal of beetle-infested trees	High	Goal 1,2	Wildfire PR	Annual Implementation	Ongoing. Defensible Space Ordinance in place. All new construction must create defensible space as part of the project as of Jan. 1, 2011 (Ord. 1, 2011). Mountain Pine Beetle Ordinance requires all property owners to remove dead and infested trees by July 15th annually (Ord. 13, 2010).
Breckenridge—4	Educate public about winter preparedness kits	High	Goal 1	Severe Winter Weather	Completed	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
				PI		
Breckenridge—5	Update and enhance evacuation plan	Low	Goal 1	Multi-Hazard ES	Completed	
Breckenridge—6	Inventory and map locations of hazardous materials	Low	Goal 1	Hazardous Materials Release ES	Continue- Not completed	Ongoing by fire department
Breckenridge—7	Locate portable wayfinding signage around Town during emergency events	Low	Goal 1	Multi-Hazard ES	Completed	
Breckenridge—8	Emergency generator power connections at pump stations	Low	Goal 1, 2	Multi-Hazard ES	Completed	Action added in 2013
Breckenridge—9	Watershed protection plan	High	Goal 1, 4	Multi-Hazard PR	Continue-Not completed	The MOU was completed in 2017. Pre-fire implementation is currently ongoing.
Breckenridge - 10	Goose Pasture Tarn Dam Rehabilitation	High	Goal 1, 2, 3	Dam Failure S, PR	New in 2020	
Breckenridge - 11	Coyne Valley Culvert Replacement	High	Goal 1, 2, 3	Flooding S, PR	New in 2020	Design completed. Construction contract not yet awarded.
Dillon—1	Develop a Hazard Mitigation Planning Committee to guide policy and implementation	Low	Goal 4	Multi-Hazard PR	Annual Implementation	Ongoing. Town Department heads meet on a regular basis.
Dillon—2	Improve education on risk and preparedness and mitigation measures	Low	Goal 1	Multi-Hazard PI	Continue-Not completed	Ongoing. The outreach program will be initiated through updating Town operated digital media.
Dillon - 3	Multi-hazard awareness and warning system	Medium	Goal 1	Multi-Hazard: wildfire, severe winter weather, hazardous	New in 2020	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
				materials, dam incident PI		
Frisco—1	Continue to implement Mountain Pine Beetle Plan to mitigate wildfire hazard	Low	Goal 1,3	Mountain Pine Beetle, Wildfire PR	Completed	As of 2019, the Town of Frisco has cleaned up all of the Pine Beetle infested areas and are seeing no further action needed on this item.
Frisco—2	Improve information on website about natural hazard risk and mitigation	Low	Goal 1	Multi-Hazard PI	Annual Implementation	The Town is committed to continue to update and improve the website, so the resources are available to spread valuable information to the public.
Frisco – 3	Maintain NFIP participation and keep CRS rating as 8 and/or improve to higher rating	Low	Goal 1, 2, 3	Flood PR, PP	New in 2020	
Frisco – 4	Amend the Frisco Unified Development Code to implement wildfire risk reduction best practices including amendments that complement the recently adopted fire code standards for defensible space	Medium	Goal 1, 2,3	Wildfire PP	New in 2020	
Silverthorne—1	Pursue implementation of special improvement districts as a mechanism to fund the undergrounding of existing overhead utility lines	High	Goal 1,2,3	Multi-Hazard PP	Completed	This project was completed in 2007. One of the four expressed interest via majority vote in favor of the project. Town Council formed the special district and the utilities were subsequently undergrounded.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Silverthorne—2	Continue to implement mountain pine beetle program and enforce ordinance	High	Goal 1,3	Mountain Pine Beetle, Wildfire PR	Completed	
Silverthorne—3	Insure emergency power for wastewater treatment plant during extended power outage	Medium	Goal 2	Multi-Hazard PP	Completed	
Silverthorne—4	Ensure continued water distribution during extended power outage	Medium	Goal 2	Multi-Hazard ES	Completed	The Town has completely automated backup power systems for all pressure zones.
Silverthorne—5	Develop action plan for responding to an explosive gas event at the head works of the Silverthorne/Dillon Joint Sewer Authority	Low	Goal 2	Haz-Mat ES	Completed	Continuous explosive gas monitoring, with automated venting is installed. This system is connected to the plant alarm call-out system.
Silverthorne---6	Cottonwood shared Silverthorne Public Works and Lake Dillon Fire Protection District facilities	Medium	Goal 2	Wildfire S	Completed	Added in 2013.
Silverthorne---7	Floodplain mapping and management	Medium	Goal 1	Flood PR	Continue – Not completed	Action added in 2013.
Silverthorne—8	Community evacuation	High	Goal 1	Multi-Hazard ES	Continue- Not completed	Action added in 2013.
Silverthorne—9	Firewise Education	Medium	Goal 1,2,3	Wildfire PR, PP, PI	New in 2020	Start in 2020 and ongoing
Silverthorne—10	Reinforce River Banks to prevent flooding onto private property.	High	Goal 1,	Flood, Dam Incident, erosion PP	New in 2020	Design in 2021 and construct in 2022
Montezuma—1	Fire protection/hydrant installation	High	Goal 1, 2	Wildfire PP	New in 2013	
Montezuma—2	Drainage Plan implementation	High	Goal 1, 2	Flood PP	New in 2013	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Buffalo Mountain Metropolitan District—1	Reduce the risk of wildfire in the Wildernest subdivision by assisting property owners with the creation of defensible spaces around residential buildings	High	Goal 1	Wildfire PP	Annual Implementation	This action has been and continues to be implemented. BMMD continues to enforce Protective Covenant rules to mandate property owners remove dead and diseased flammable vegetation. Further, BMMD was awarded a $25,000 wildfire defensible space grant from Summit County this year as a pass along grant to community property owners to encourage removal of flammable vegetation within 30' of the home.
Buffalo Mountain Metropolitan District—2	Enhance the ability to ensure continuity of water and sewer service during emergencies by converting paper as-built infrastructure drawings to digital format	Medium	Goal 2	Multi-Hazard PR	Annual Implementation	This action has been and continues to be implemented. In 2017, BMMD purchased a GPS to accurately locate water, sewer, road, and critical facilities throughout the community. The data was uploaded to the existing BMMD GIS map. On-going maintenance and repairs are also recorded in the GIS system. BMMD has also shared critical infrastructure information with the WildFire Decision Support Sy

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						stem (WFDSS). The WFDSS system provides a web-based decision support tool created to help agency administrators and wildland fire managers make informed decisions by easily identifying critical facilities during fires.
Buffalo Mountain Metropolitan District—3	Obtain backup power for water pumping stations	High	Goal 2	Multi-Hazard PP	Completed	This action has been completed. BMMD recently purchased a portable generator in 2019 to power the water intake facility and all water pump stations throughout the District during power outages.
Buffalo Mountain Metropolitan District—4	Develop drainage improvement plan to reduce erosion and flooding to avert severe winter weather hazard	Medium	Goal 1	Multi-Hazard PR	Annual Implementation	Action added in 2013. This action has been and continues to be implemented. In 2015, BMMD constructed two separate underground storm sewer projects including curb/gutter improvements to manage erosion and flooding during high volume water run-off in spring and summer. BMMD is currently planning a similar storm sewer project to begin construction in 2020.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Buffalo Mountain Metropolitan District—5	Continue to implement mountain pine beetle program	Low	Goal 1	Wildfire/Pest Infestation PR	Annual Implementation	Action added in 2013. This action has been and continues to be implemented. As previously stated in Action #1, BMMD was awarded a $25,000 wildfire defensible space grant from Summit County to pass along to community property owners to encourage removal of flammable vegetation within 30' of the home. In August 2019, BMMD mailed out to all community property owners a flyer with information about the importance of defensible space with tips on what to remove to improve a home's chance of surviving a wildfire. To date, 35 properties have applied for grant assistance. BMMD also disseminates information on the District website about the annual Summit County free wood chipping program and encourages property owner participation.
Buffalo Mountain Metropolitan District—6	Source water protection plan	Medium	Goal 1, 4	Flood, Drought PR	Completed	Action added in 2013. This action has been completed. In March 2017, BMMD

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						completed a State approved Source Water Protection Plan. The planning effort consisted of public planning meetings and individual meetings with water operators, government, local community members, and agency representatives. The Plan provides an inventory of potential contaminant sources and best management practices to mitigate concerns.
Buffalo Mountain Metropolitan District—7	Electronic communication with district constituents in cases of emergency (database of email address)	High	Goal 1	Multi-Hazard ES	Annual Implementation	Action added in 2013. This action has been and continues to be implemented. BMMD has been successful in obtaining about 95% of customer email contact information. As properties change ownership, BMMD continues to update email information accordingly. This has proved to be an important tool to communicate with customers on a timely basis.
Buffalo Mountain Metropolitan District – 8	Increase Water Storage Capacity	High	Goal 1,2	Drought PR	New in 2020	
Summit Fire& EMS Authority—1	Maintain and enhance wildfire mitigation program	High	Goal 1,3	Wildfire PR	Completed	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Summit Fire & EMS Authority —2	Install emergency generators in three fire stations	Medium	Goal 1,2,3	Multi-Hazard PP	Completed-Continuing	An external natural gas fueled generator was installed in 2011 and is operational at Station 11 in Keystone. Station 8 in Dillon had a natural gas-fueled generator installed in 2018. Budgeting for generators at Stations 1 & 2 are included in the five-year capital plan contingent upon available funding.
Summit Fire & EMS Authority—3	Rural addressing	High	Goal 1,	Wildfire ES	Continue-Not Completed	New in 2013
Summit Fire & EMS Authority – 4	Additional Fire Station in Silverthorne	High	Goal 1, 2	Wildfire ES,	New in 2020	
Summit Fire & EMS Authority – 5	Provide backup power to Frisco fire station to protect continuity of services	High	Goal 1, 2	Multi-Hazard PR, ES,	New in 2020	
Red, White, and Blue Fire Protection District—1	Create public education program encouraging wildfire defensible space	High	Goal 1	Wildfire PI	Annual Implementation	Each shift has dedicated defensible space staff that handles the public education and voluntary inspection program. We are working on national certification through NFPA for our staff.
Red, White, and Blue Fire Protection District—2	Promote household winter preparedness kits	High	Goal 1	Severe Winter Weather PI	Completed	This project was completed through our elementary school public education programs and is now part of our annual educational programs in the schools.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Red, White, and Blue Fire Protection District—3	Provide backup power to fire stations to protect continuity of services	Medium	Goal 2	Multi-Hazard PP	Completed	This project was completed with the installation of the last generator at Station 7 in December of 2019. All of the generators were purchased as dual fuel LPG/Natural Gas systems. A contract was signed for LPG emergency service in the event of a Natural Gas system failure
Red, White, and Blue Fire Protection District—4	Conduct periodic community evacuation drills	Medium	Goal 1	Multi-Hazard ES	Annual Implementation	This is part of RWB FPD 1 and our defensible space and public education programs.
Red, White, and Blue Fire Protection District—5	Inventory and map locations of hazardous materials	Low	Goal 1	Hazardous Materials Release PR	In progress	This project is currently in progress and is now part of a larger project to identify Critical Infrastructure and Key Resources.
Red, White, and Blue Fire Protection District—6	Rural addressing	Low	Goal 1	Wildfire ES	In progress	Action added in 2013. This is an ongoing project that is tied to our mitigation program. To date just over 150 reflective address signs have been installed in Blue River.
Red, White, and Blue Fire Protection District—7	Firewise communities program	Low	Goal 1, 4	Wildfire PI	In progress	Action added in 2013. The Fire District continues to work with HOAs to become Firewise Communities. Since 2013 we have added The Woods, Riverwood, and

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						North Star Village HOAs to our list of communities.
Red, White, and Blue Fire Protection District – 8	Develop a threat and hazard assessment for each critical infrastructure in the District and identify risk reduction strategies	Medium	Goal 2	Multi-Hazard PP	New in 2020	
Red, White, and Blue Fire Protection District – 9	Develop inspection strategies and response plans for locations identified as Critical Infrastructure of key resources in the community	Medium	Goal 2	Multi-Hazard PP	New in 2020	
Copper Mountain Consolidated Metropolitan District—1	Wildland urban interface (WUI) fuels reduction program	Medium	Goal 1	Wildfire/ Pest Infestation PR	Annual Implementation	Action added in 2013. Controlled burns of slash piles in Lewis Ranch completed in 2019.
Copper Mountain Consolidated Metropolitan District—2	Enhanced public notification through cable network	Low	Goal 1	Multi-Hazard PI	In progress	Action added in 2013
Copper Mountain Consolidated Metropolitan District—3	Replace Copper Road West Tenmile culverts and Copper Circle West Tenmile culverts	Low	Goal 1, 2	Flood PP	In progress	Action added in 2013
Copper Mountain Consolidated Metropolitan District—4	Community wildfire protection planning	Medium	Goal 1, 4	Wildfire PR	Annual Implementation	Action added in 2013
Copper Mountain Consolidated Metropolitan District—5	Avalanche Mitigation and Reduction	High	Goal 1,2,3	Avalanche PR PP	New in 2020	
Water and Water/Sanitation Districts -1	Backup power connection for treatment plants	High	Goal 1, 2	Multi-Hazard PP	In Progress	Added in 2013. Dillon Valley is in bid stage for 2020 completion; not completed for EDWD. Not completed for Mesa Cortina

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Water and Water/Sanitation Districts -2	Trailer mounted generator	High	Goal 1, 2, 3	Multi-Hazard ES	In Progress	Added in 2013. Dillon Valley is making a list of contacts with portable generators in surrounding areas; not completed for EDWD or Mesa Cortina.
Water and Water/Sanitation Districts -3	Maintain existing wildfire mitigation efforts and identify access road mitigation needs	High	Goal 1, 2	Wildfire PR	In Progress	Added in 2013. EDWD implements wildfire mitigation actions annually. Not completed for Dillon Valley. Completed and Continuing for Mesa Cortina.
Water and Water/Sanitation Districts - 4	Develop Source Water Protection Plan (SWPP)	High	Goal 1, 3	Multi-Hazard NR	In Progress	Added in 2013. Not completed for EDWD but in progress for Dillon Valley District. Mesa Cortina completed action in 2012.
Water and Water/Sanitation Districts - 5	Hazardous Materials – Transporation mitigation planning	High	Goal 1,2,3	Hazardous Materials PR, PP	New in 2020	See also related Summit County Action #24 Hazmat Roadway Projects
Water and Water/ Sanitation Districts - 6	Hydrologic Monitoring	Low	Goal 1,3	Drought PI	New in 2020	
Water and Water/Sanitation Districts - 7	Cast iron water main replacement project	Medium	Goal 2,3	Flood, Drought PR, S	New in 2020	
Hamilton Creek Metro District- 1	Backup power for treatment plant	High	Goal 1, 2	Multi-Hazard PP	Continue-Not completed	Action added in 2013. In planning stages and will be included in the Districts Capital Improvement Plan update.
Hamilton Creek Metro District - 2	Water supply interconnect	High	Goal 1, 2	Multi-Hazard ES	Continue- Not Completed	Included in the District's Capital Improvement Plan. The District will now need to

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
						negotiate with the town of Silverthorne. Action added in 2013.
Hamilton Creek Metro District - 3	Maintain existing wildfire mitigation efforts	High	Goal 1, 2	Wildfire PR	Continue- Not Completed	Action added in 2013.
Hamilton Creek Metro District- 4	Continue education and outreach about water conservation	High	Goal 1	Multi-Hazard PI	Completed-continuing	Electronic water meters installed in 2009. District is continuing education and outreach efforts.
Hamilton Creek Metro District - 5	Develop Source Water Protection Plan (SWPP)	High	Goal 1, 3	Multi-Hazard NR	Continue – Not Completed	The District received a SWAP grant, the development of the SWPP is in the process of being developed. Action added in 2013.
Hamilton Creek Metro District - 6	Hydrologic Monitoring	Low	Goal 1,2	Drought ES, PI	New in 2020	
Denver Water—1	Update drought management plan	High	Goal 1	Drought PR	Continue-Not Completed	Action added in 2013
Denver Water—2	Public outreach efforts – Denver Water government stakeholder group would like to partner with Summit County stakeholders and rebuild relationships, provide networking and education for the public	Low	Goal 1	Multi-Hazard PI	Continue – Not Completed	Action added in 2013. Refer to Summit County Strategic Comms Plan to assist with alert/notification, response efforts and overall information sharing.
Denver Water—3	Develop GIS mapping coordination project to show damages based on dam EAPs, flood maps, and county floodplains	Low	Goal 1, 2	Dam Failure PR	Completed	Action added in 2013. EAP for dams are reviewed and updated on a regular basis.
Denver Water – 4	Watershed management program: Forests to Faucets Partnership	High	Goal 1	Multi-Hazard: Wildfire, Flood, Drought, Pest Infestation	New in 2020	In progress, began in 2010 and timelines go through 2022.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
				NR		
Denver Water – 5	Implement Summit County Runoff Season Safety Strategy Communications Plan	Low	Goal 1	Flood PI	New in 2020	Ongoing

*PR = prevention, PP = property protection, S = structural, NR = natural resource protection, ES = emergency services, PI = public information

Table 4-4 Deleted Mitigation Actions from 2013 Plan

Jurisdiction/Action #	Action Description	Hazard(s)	Comments
Denver Water - 2	Develop Intergovernmental agreement with Summit County	Wildfire	Denver Water as agreements in place for the Security Taskforce Group with were not documented in 2013.
Denver Water – 3	AOP updated for property owners	Wildfire	Denver Water is in constant coordination with Summit County.
Multi-Jurisdictional -7	Emergency Operations Plan Exercise	Multi-Hazard	

Mitigation Action: Multi-Jurisdictional—1 Plan Maintenance and Implementation

Jurisdiction:	Multi-Jurisdictional
Action Title:	Meet annually or after a disaster event to monitor and evaluate the implementation of the plan.
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	The Hazard Mitigation Planning Committee formed to develop the Summit County Multi-Hazard Mitigation Plan needs to continue to exist and be comprised of a broad base of stakeholders. Holding annual meetings will help keep the plan action-oriented and will assist in a more effective five-year update process. This action was updated in 2013 to align with the process for monitoring, evaluating, and updating the plan described in Chapter 5 Plan Implementation and Maintenance and is related to Multi-Jurisdictional-5 action.
Ideas for Implementation:	The Summit County Emergency Manager will coordinate the meeting. The meeting is targeted to occur in December. Meeting agendas will incorporate the process described in Chapter 5 Plan Implementation and Maintenance. Members of this committee are coordinated with regularly as members of the public safety committee described in Mitigation Action Multi-Jurisdictional—5
Responsible Agency:	Summit County Office of Emergency Management
Partners:	All partner agencies and entities identified and participating in the Hazard Mitigation Planning Committee.
Potential Funding:	Summit County and jurisdictions
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Helps build relationships and understanding of the important issues involved in mitigation planning. • Improves communication and coordination within County. • Keeps plan current and accurate.
Timeline:	Annual Implementation every December.
Status:	Ongoing. This review has occurred as groups meet to review and discuss the hazards with highly likely ratings,

Mitigation Action: Multi-Jurisdictional—2 Public Involvement

Jurisdiction:	Multi-Jurisdictional
Action Title:	Continue public involvement in mitigation activities
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Ideas for Implementation:	The Summit County Office of Emergency Management will prepare and conduct a series of presentations focused upon coordination and improvement of mitigation activities. Use local media sources to announce progress on the mitigation plan and ideas for future activities. This project will also involve developing and expanding educational materials related to hazards in Summit County and household preparedness measures. These materials may include fact sheets, public service announcements, and presentations to specific groups. Severe winter weather, drought, and wildfire are priority hazards that the materials will address.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	All participating local governments and special districts and local media sources.
Potential Funding:	Summit County and jurisdictions
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• This outreach will be a necessary component of the local adoptions of the multi-hazard mitigation plan. The work will build relationships and understanding of the important issues involved in mitigation planning. • Implements mitigation plan. • Improves communication and coordination. • Increases public education and awareness.
Timeline:	Annual Implementation
Status:	Ongoing. This action occurs in a number of meetings and venues. Wildfire mitigation received the highest degree of attention with activities organized through the Wildfire Council.

Mitigation Action: Multi-Jurisdictional—3 Emergency Sheltering Plans

Jurisdiction:	Multi-Jurisdictional
Action Title:	Improve coordination of local emergency sheltering plans
Hazard(s) Mitigated	Multi-Hazard, Severe Winter Weather
Priority:	High
Ideas for Implementation:	The Office of Emergency Management will begin a process under Emergency Support Function-6 (ESF-6) Mass Care and Sheltering to identify the role and responsibilities of each local government and American Red Cross with regards to emergency sheltering. The improvement plan from a mass sheltering action on December 31, 2007, identified many of these issues, which we will work to address.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	Local governments in Summit County and the American Red Cross.
Potential Funding:	Summit County and jurisdictions
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• This work is necessary to avoid confusion and duplication of efforts during emergency sheltering operations. • Improves communication and coordination. • Protects public health and safety.
Timeline:	-
Status:	**Completed.** Shelter plans have been consolidated with the American Red Cross taking the lead for this action.

Mitigation Action: Multi-Jurisdictional—4 Public Safety Meetings

Jurisdiction:	Multi-Jurisdictional
Action Title:	Consolidate fragmented meetings into one public safety meeting and/or stimulate interest in local emergency planning committee (LEPC)
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	The Summit County public safety agencies could benefit from a coordinated meeting where functions of public safety would meet. This could eliminate many fragmented meetings and reduce demands on participants to schedule another meeting.
Ideas for Implementation:	The Summit County Office of Emergency Management will consult with leadership of public safety agencies and discuss the opportunity to consolidate the many fragmented public safety meetings currently being held in Summit County. As an alternative, the same stakeholders will be approached about stimulating interest in the LEPC which exists mostly in name at a County government level.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	All local governments and special districts
Potential Funding:	Summit County and jurisdictions
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Improved communication and coordination.
Timeline:	-
Status:	**Completed**. Implemented in 2009. This action resulted in the establishment of a single Public Safety Meeting day. As a result, some meetings were consolidated, and scheduling of attendees was improved. The LEPC has been re-established and is meeting on a regular schedule. The County Emergency Manager brings mitigation Plan topics into these meetings as an ongoing way to keep mitigation in the discussion and monitor implementation.

Mitigation Action: Multi-Jurisdictional—5 Wildfire Policy Coordination

Jurisdiction:	Multi-Jurisdictional
Action Title:	Coordinate wildland-urban interface policies and programs for improved consistency between the towns and the County.
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	The mixture of government boundaries and land ownership in Summit County results in a variety of wildfire mitigation programs and policies. We believe there are many valid initiatives and efforts underway and stakeholders and citizens would benefit from further improvements in coordination.
Ideas for Implementation:	The Summit County Wildfire Council will begin to address this action at quarterly meetings and may bring together a focused workgroup to identify the projects completed, in progress, and still in the planning process. We also understand the value of coordinating with the U.S. Forest Service in this effort. The coordinated effort by governments would demonstrate to the public the serious nature of these efforts.
Responsible Agency:	Summit County Wildfire Council
Partners:	Summit County; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; Lake Dillon and Red, White, and Blue Fire Protection Districts; U.S. Forest Service; Colorado State Forest Service
Potential Funding:	Summit County and jurisdictions
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Improve communication and coordination. • Prevent duplication of efforts. • Reduce future losses due to wildfire. • Protect public health and safety.
Timeline:	Annual Implementation
Status:	**Completed** and implemented in 2009 and ongoing. Collaboration between the County and Towns on wildfire concerns is high and recognizes there are structural differences between the County and Town Governments. The County and Towns have uniformly adopted the Fire Code and through Building Codes are supporting wildfire policies such as defensible space.

Mitigation Action: Multi-Jurisdictional—6 Emergency Planning Coordination

Jurisdiction:	Multi-Jurisdictional
Action Title:	Coordinate County emergency planning with Regulated Entities Emergency Planning and hazard vulnerability assessments (HVA).
Hazard(s) Mitigated	Multi-Hazard
Priority:	Medium
Issue/Background:	The emergency response and planning for a regulated facility could be improved by a coordinated process for planning and assessment.
Ideas for Implementation:	The Summit County Office of Emergency Management (OEM) will coordinate with public safety agencies and regulated facilities, such as dam owners, regarding their emergency planning, exercising, and hazard vulnerability assessments. OEM will encourage a collaborative partnership between emergency planners, public safety agencies, and facility owners to address and evaluate emergency management activities.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	All local governments and special districts
Potential Funding:	Summit County and jurisdictions
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Improve communication and coordination. • Protect critical facilities and infrastructure. • Protect public health and safety.
Timeline:	-
Status:	**Completed** and implemented in 2009. Improved planning continues take place between facilities required to have emergency action plans and the County, Towns and Special Districts. The formation of the Dillon Dam Security Task Force is an example of this improved level of cooperation.

5 Plan Implementation and Maintenance

This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

Chapter 2 Planning Process includes information on the implementation and maintenance process since the 2013 plan was adopted. This section includes information on the onging implementation and maintenance process and reflects adjustments made in the 2020 update.

5.1 Implementation

44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Implementation and maintenance are critical to the mitigation plan's overall success. While this plan makes many important recommendations, the jurisdictions will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful plan implementation.

Implementation will be accomplished by adhering to the schedules identified for each mitigation action in Table 4-3 in Chapter 4 Mitigation Strategy, and through pervasive efforts to network and highlight the multi-objective, win-win benefits of each project to the Summit County community and its stakeholders. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe and resilient community.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms, such as comprehensive planning, capital improvement budgeting, economic development goals and incentives, and other regional plans. *Mitigation is most successful when it is incorporated in the day-to-day functions and priorities of government and in land use and development planning.* This integration can be accomplished through identifying multi-objective, win-win programs and projects and through the routine actions of monitoring agendas, attending meetings, sending memos, and promoting safe, sustainable communities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This will include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the participating jurisdictions will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, County Wildfire Council Hazardous Fuel Reduction Grant fund, special district budgeted funds, state and federal earmarked funds, and other grant programs, including those that can serve or support multi-objective applications. Additional mitigation strategies include consistent and ongoing enforcement of existing rules and regulations and vigilant review of countywide programs for opportunities for better coordination. Other funds may include HMGP-Post Fire funding when Fire Management Assistance Grants are provided to Colorado for significant fires involving federal lands. The FEMA Building Resilient

Infrastructure and Communities (BRIC) funding will be another source to monitor as it becomes available in 2020.

5.2 Monitoring, Evaluating, and Updating the Plan

44 CFR Requirement 201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

5.2.1 Role of the Hazard Mitigation Planning Committee

With adoption of this plan, the HMPC will be tasked with plan monitoring, evaluation, and maintenance. The participating jurisdictions and agencies, led by the County Emergency Manager within the Summit County Office of Emergency Management or other designated organization elements, plan to conduct the following meetings and activities:

- Meet annually or after a disaster event to monitor and evaluate the implementation of the plan; this activity is further described in Mitigation Action Multi-Jurisdictional—1.

HMPC members also serve on various public safety planning committees and have regular meetings that are hazard specific. The County Emergency Manager will bring MHMP topics into these meetings as an ongoing way to tie mitigation initiatives into related activities and to monitor implementation.

Additionally the HMPC agrees to:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Keep 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;
- Report on plan progress and recommended changes to the Summit County Board of County Commissioners and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The HMPC is an advisory body and will not have any powers over County, city, town, or district staff. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website.

5.2.2 Plan Maintenance Schedule

The HMPC agrees to meet annually and after a hazard event to monitor progress and update the mitigation strategy. The meeting is targeted to occur in December each year. The Summit County emergency manager is responsible for initiating these plan reviews. In conjunction with the other participating jurisdictions, a five-year written update of the plan will be submitted to the Colorado Department of Homeland Security and Emergency Management (DHSEM) and FEMA Region VIII.

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 unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. Efforts to begin the next update should begin no later than January 2024. The County will inquire with DHSEM and FEMA for funds to assist with the update in 2022 as most applicable grants have multiple years to expend the funds. Funding sources may include the Emergency Management Performance Grants, Pre- Disaster Mitigation, Hazard Mitigation Grant Program (if a presidential disaster has been declared), FMAG, BRIC and Flood Mitigation Assistance grant funds. The next plan update is anticipated to be completed and reapproved by DHSEM and FEMA Region VIII by January 2025.

5.2.3 Plan Maintenance and Evaluation Process

The HMPC will continually observe the incorporation process, evaluation method, updating method, continued public participation, and completion of the action/projects to assure that the planning team and the plan itself are performing as anticipated. By monitoring these processes, the planning team will then be able to evaluate them at the time of the plan update, determining if any changes are needed. The HMP plan update every five years provides an opportunity to determine whether there have been any significant changes in the county that may, in turn, necessitate changes in the types of mitigation actions proposed.

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions,
- Increase or decrease in capability to address hazards,
- Changes to federal and state legislation,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or
- Increased vulnerability as a result of new development (and/or annexation).

Updates to this plan will:

- Consider changes in vulnerability due to action implementation,
- Document success stories where mitigation efforts have proven effective,
- Document areas where mitigation actions were not effective,
- Document any new hazards that may arise or were previously overlooked,
- Incorporate new data or studies on hazards and risks,
- Incorporate new capabilities or changes in capabilities,
- Incorporate growth and development-related changes to inventories, and
- Incorporate new action recommendations or changes in action prioritization.

To best evaluate any changes in vulnerability as a result of plan implementation, the participating jurisdictions will use the following process:

- A representative from the responsible office identified in each mitigation action will be responsible for tracking and reporting on an annual basis to the jurisdictional 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.
- If the action does not meet identified objectives, the jurisdictional lead will determine what additional measures may be implemented, and an assigned individual will be responsible for defining action scope, implementing the action, monitoring success of the action, and making any required modifications to the plan.

As a measure of progress the HMPC will evaluate the overall percentage of actions implemented within each five-year update cycle. During the five-year plan update process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Are the goals and objectives consistent with changes in State and Federal policy?
- Complete status update on all mitigation projects. What strategies should be revised?
- Has the nature or magnitude of risks changed (current and expected conditions)?
- Are the current resources appropriate for implementing the LHMP?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did the county and participating agencies and other partners participate in the plan implementation process as assigned?

Changes will also be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, timeframe, 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. Updating of the plan will be by written changes and submissions, as the Summit County Office of Emergency Management deems appropriate and necessary, and as approved by the Summit County Board of Commissioners and the governing boards of the other participating jurisdictions.

Summit County is committed to involving the public in the continual reshaping and updating of the Hazard Mitigation Plan, as discussed in Section 5.4 Continued Public Involvement.

5.2.4 Disaster Proclamation or Declaration

Following a disaster proclamation or declaration, the HMP will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of the Office of Emergency Services to reconvene the Hazard Mitigation Planning Committee and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

5.3 Incorporation into Existing Planning Mechanisms

44 CFR Requirement §201.6(c)(4)(ii):[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. Based on the capability assessments of the participating jurisdictions, communities in Summit County continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- Summit County Countywide Comprehensive Plan and four watershed basin master plans
- Summit County Emergency Operations Plan
- Summit County Community Wildfire Protection Plan
- Comprehensive or master plans of participating jurisdictions
- Ordinances of participating jurisdictions

- Capital improvement plans and budgets
- Other community plans within the County, such as water conservation plans, stormwater management plans, source water protection plans, and parks and recreation plans
- Other plans and policies outlined in the capability assessments in the jurisdictional annexes

The County documented its intention to incorporate information from the multi-hazard mitigation plan into community master plans in mitigation action Summit County—8 (Incorporate information from the multi-hazard mitigation plan into community master plans) and its intention to improve integration with the Community Wildfire Protection Plan and the multi-hazard mitigation plan in mitigation action Summit County—3 (Integrate wildfire mitigation strategies identified in the Summit County Community Wildfire Protection Plan (CWPP) into the multi-hazard mitigation plan) in the mitigation strategy. Progress on these efforts can be referenced in the respective action descriptions in Annex A.

As an action step to ensure integration with other planning mechanisms the County Office of Emergency Management Manager or designee will discuss this topic at the annual meeting of the HMPC described in subsection 5.2.2. The HMPC will discuss where there are opportunities to incorporate the plan into other planning mechanisms and who would be responsible for leveraging those opportunities. HMPC members representing local jurisdictions will work with their jurisdictional planning teams to integrate their identified mitigation actions into their own local plans and programs. Efforts should be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this hazard mitigation plan.

5.4 Continued Public Involvement

44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

The update process provides an opportunity to publicize success stories from the plan's implementation and seek additional public comment. Information will be posted in the *Summit Daily News* and on the County website following the annual review of the mitigation plan. A public hearing(s) to receive public comment on plan maintenance and updating will be held during the update period. When the HMPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process, including those who joined the HMPC after the initial effort, to update and revise the plan. Public notice will be posted and public participation will be invited, at a minimum, through available website postings and press releases to the local media outlets, primarily newspapers. Continued public involvement is documented in the mitigation strategy in the action Multi-Jurisdictional—2 and is implemented annually. Activities related to public involvement during the 2020 update are documented in Chapter 2 and Appendix B.

ANNEX A UNINCORPORATED SUMMIT COUNTY

Jurisdictional annexes provide specific information unique to each jurisdiction participating in the hazard mitigation plan. For unincorporated Summit County, countywide information related to sections A.1 Community Profile, A.2 Hazard Identification and Profiles, and A.3 Vulnerability Assessment is addressed previously in the main plan. The location of this information is referenced below. The remainder of this annex focuses on the Capability Assessment and Mitigation Strategy unique to the County government.

A.1 Community Profile

Community profile information and the base map for Summit County are provided in Section 1.5 Planning Area Profile.

A.2 Hazard Identification and Profiles

Countywide hazard identification and profiles information can be found in Section 3.1 Hazard Identification and Section 3.2 Hazard Profiles.

A.3 Vulnerability Assessment

The vulnerability assessment analyzes the population, property, and other assets at risk to hazards and estimates potential losses where data is available. Facilities owned by the County are inventoried in Table A-1. Other countywide vulnerability information is covered in Section 3.3 Vulnerability Assessment in the main plan.

Table A-1 Unincorporated Summit County—Critical Facilities and Other Community Assets

Name of Asset	Address	Replacement Value ($)	Hazard Concerns
Breckenridge Area			
Courthouse	208 E. Lincoln	3,371,493	
Justice Facility	501 Park Drive	13,202,471	
District Attorney's Offices	1760 Airport Road Unit A	594,776	
Library	504 Airport Road	803,505	
Tyrollean Radio Site	Barney Ford Hill	23,683	
High School Radio Site	0059 CR 1	2,783	
Copper Mountain Area			
Copper Mountain Radio Site	**SE of 3371 Hwy 91, Parcel 3**	**29,621**	
Dillon Area			
Snake River Wastewater Treatment Plant	4344 Swan Mountain Road	21,411,693	
Snake River Wastewater Treatment	0297 Summit County Road 120	1,277,528	
Snake River Wastewater Treatment Plant Digestor	0297 Summit County Road 120	219,475	
Wastewater Treatment Plant	4344 Swan Mountain Road	2,104,672	

Name of Asset	Address	Replacement Value ($)	Hazard Concerns
Sewage Lift Station	4533 Swan Mountain Road	48,333	
Material Recovery Facility	683 Landfill Road	2,878,001	
Water Storage Tank	642 Landfill Road	713,246	
Landfill Maintenance Garage	725 Landfill Road	1,849,981	
Frisco Area			
Ambulance Search and Rescue	128 CR 1004	401,887	Wildfire
Road and Bridge Building Department	128 CR 1004	383,009	Wildfire
Road and Bridge Main Shops	128 CR 1004	847,155	Wildfire
Storage	187 CR 1004	264,840	Wildfire
Sand Storage	218 CR 1004	74,006	Wildfire
Bus Garage	0222 SCR 1004	754,469	Wildfire
Library/Administration	0037 CR 1004	14,082,777	Wildfire
Emergency Services Facility	0227 CR 1003	2,348,292	Wildfire
Transfer Center	1010 Meadow Drive	626,000	
Animal Shelter, Classroom, Office	0191 CR 1004	1,702,308	Wildfire
Community and Senior Center	0151 CR 1004 Peak 1 Boulevard	3,661,946	Wildfire
Summit County Medical Offices	360 Peak One Drive	6,856,461	Wildfire
St. Anthony Summit Medical Center	340 Peak One Drive	N/A	Wildfire
Summit County Offices (2nd Floor)	360 Peak One Drive	870,000	Wildfire
Heeney Area			
Summit County Barn	1294 CR 30	80,864	
Summit County Road and Bridge Shop	6631 CR 30	80,046	
Heeney Radio Site	CR 30 at Willows Campground	24,827	
Keystone Area			
County Maintenance Building	1252 Keystone Ranch Road	96,276	
Landfill Maintenance/Storage Building	Landfill Road	13,356	
Snake River Radio Site	22393 Highway 6	939	
Silverthorne Area			
Search and Dive Rescue	222 Adams	79,830	
North Branch Library	651 Center Circle	3,197,017	
Wildernest Radio Site	Ryan Gulch Road at Wildernest	93,894	

Source: Summit County Office of Emergency Management

A.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

Regulatory Mitigation Capabilities

Table A-2 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Summit County.

Table A-2 Summit County—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	2009 – update began in 2018
Zoning Ordinance	Yes	Summit County Development Regulations
Subdivision Ordinance	Yes	Summit County Development Regulations
Growth Management Ordinance	Yes	Summit County Development Regulations
Floodplain Ordinance	Yes	Floodplain Overlay District
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	Yes	Chapter 44 of the County Building Code, Fire Mitigation Standards for New Development Development Code Chapters 6 and 7 include erosion control and revegetation requirements
Building Code	Yes	Version: 2018 International Code Council
Erosion or Sediment Control Program	Yes	
Stormwater Management Program	Yes	All large-scale development is required to have drainage designed to handle the 25-year storm event. Detention must be provided that will release water at the 25-year historic rate.
Site Plan Review Requirements	Yes	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Complete re-write of existing plan being finalized in 2020.
Other Special Plans	Yes	Summit County Community Wildfire Protection Plan, Summit County Climate Action Plan
Flood Insurance Study or Other Engineering Study for Streams	Yes	FEMA Flood Insurance Study, November 16, 2018
Elevation Certificates	Yes	

Summit County Planning developed the matrix in Table A-3 listing their hazard mitigation measures. More detailed information on mitigation related plans and policies follows the matrix.

Table A-3 Development Constraints, County Concerns, and Mitigation Measures

Constraint	County Concerns	Mitigation
Flood Fringe	Flood hazards to structures; Public health, safety, and welfare	A. Compliance with County Floodplain Regulations (See Section 4100 of the Summit County Land Use and Development Code)
Floodway	Flood hazards to structures; Public health, safety, and welfare	A. Compliance with County Floodplain Regulations (See Section 4100 of the Summit County Land Use and Development Code)
Geologic Hazard Areas	Avalanche paths; Landslide areas; Rock falls; Debris flows; Mudflows;	A. Avoiding placement of structures on areas subject to geologic hazards
		B. Submitting geotechnical report identifying hazards and recommending methods of construction to alleviate hazards; designing structures in accordance with recommendations contained in geotechnical report (See Chapter 6 of the Summit County Land Use and Development Code)

Constraint	County Concerns	Mitigation
	Unstable slopes or soils; Seismic effects; Ground subsidence radioactivity	C. Providing grading and foundation plans prepared by a registered professional engineer (See Chapter 6 of the Summit County Land Use and Development Code)
		D. Complying with recommendations of the State Geological Survey (See Chapter 8 of the Summit County Land Use and Development Code)
		E. Modifying land uses so that structures are minimized or eliminated
		F. Clustering development to avoid hazard areas
Slopes Exceeding 30 Percent	Amount of site disturbance; Visual scarring; Slope stability; Soil erosion; Release of phosphorus; Wildfire potential (See also wildfire as constraint)	A. Avoiding placing such items as parking lots which require large, flat-surfaced areas on steep slopes
		B. Modifying land uses so site disturbance is minimized
		C. Proposing smaller scale rather than larger scale development in order to minimize the amount of site disturbance
		D. Designing structures so they are stepped or otherwise fit with the terrain
		E. Minimizing the extent of roads
		F. Clustering development to avoid steep slopes
		G. Providing financial commitment to, and implementation of, a revegetation program (Required by Chapter 5, 7 and Section 3600 of the Summit County Land Use and Development Code)
Wetlands	Degradation of natural environment; Loss of wildlife habitat; Loss of cleansing action of wetlands; Disruption of natural corridors; Loss of amenity in project	A. Proposing land uses which are not disruptive to wetlands
		B. Clustering development to avoid wetlands areas
		C. Complying with 404 permit procedures
		D. Replacing wetlands on a 1:1 basis within same ecosystem
Wildfire	Fire hazard to structures; Public health, safety, welfare	A. Submitting forest management plan approved by Colorado State Forest Service, and implementing measures needed to mitigate or eliminate hazard (required for areas of moderate or severe hazard by Chapter 8 of the Summit County Land Use and Development Code)
		B. Providing multiple points of access
		C. Using fire retardant roof covering materials in accordance with the building code
		D. Installing fire sprinkler system

Source: Summit County Planning Department

Countywide Comprehensive Plan, 2009

The Summit County Countywide Comprehensive Plan serves as the County's policy guidance and directs decisions that affect the physical and socioeconomic development of the County. The plan's overall vision is to "preserve and enhance our vibrant, attractive, and prosperous mountain community where people choose to live, work, recreate, and visit." Goals and policies related to hazard mitigation include the following:

Environment Element

- Goal A: Protect and preserve environmentally sensitive areas.
  - Policy/Action 6: The County should work cooperatively with homeowner groups and the state and federal forest services to promote healthy and naturally diverse forests while reducing wildfire hazards.
- Goals B-F: Wetland preservation and enhancement.
- Goal H: Protect and enhance the quality and quantity of water resources in the County.
  - Policy/Action 1: Reduce water consumption and manage water resources in a more sustainable manner.
  - Policy/Action 2: Development and other land use activities (e.g., highway operations and industrial activities) should avoid water quality impacts from erosion and sedimentation and should not result in degradation of water quality as measured by Colorado's Antidegradation Policy.
  - Policy/Action 8: Ensure that new development does not disturb surface or subsurface hydrologic flows to the extent that recharge of nearby wetlands and streams are adversely affected.
  - Policy/Action 14: Support projects that restore stream channels and natural conditions, provide erosion control, and improve fish and wildlife habitat.

Land Use Element

- Goal D: Guide the appropriate development of land through the County's master plans and development regulations.
  - Policy/Action 3.1: To the extent practicable, retain trees and forested areas while providing protection of the resources listed above and while allowing for forest management practices necessary for forest health and wildfire prevention.

Design and Visual Resources Element

- Goal E: Avoid or minimize development impacts on steep hillsides and ridgelines.
  - Policy/Action 1: Development on ridgelines and steep slopes should be avoided wherever possible. Where no feasible alternative exists, buildings on ridgelines and slopes should be located and designed so that the existing visual dominance of the natural landform, vegetation and topography is maintained.
  - Policy/Action 2: Minimize the need for grading, earth moving, vegetation removal, and site disturbance related to development on sloped areas.
  - Policy/Action 3: Grading or earth moving to create a flat building pad on a slope should be discouraged; instead, buildings should be stepped to fit with the natural terrain.

Watershed Basin Master Plans

Each of the County's four watershed basins, Upper Blue, Snake River, Ten Mile, and Lower Blue, has a basin master plan that provides further specific direction on land use decisions within the basin. Within each basin, there may be a subbasin plan to address unique circumstances on a neighborhood or regional

scale. The Snake River Master Plan addresses flooding, avalanche hazards, steep slopes and other geologic hazards, wildfire and the transportation of hazardous materials in various sections of the plan. Within the plan's Affordable Workforce Housing element wildfire is addressed in relationship with siting future development. One of the policies in Appendix C guides development to avoid slopes over 30 percent slope and 100-year floodplains. The plan also includes maps that identify hazardous areas including 30 percent or great slopes and environmentally sensitive areas.

Summit County Land Use and Development Code

The Summit County Development Code is the legal framework outlining policies for development projects within the County's jurisdiction. It is organized under 16 chapters and various subsections. Code ordinances related to hazard mitigation are described below:

Zoning Regulations

3506: Transfer of Development Rights (TDRs) Program Regulations

Summit County's TDR program is another tool the County uses to protect the County's natural resources and lessening the risk of wildfire to future development in the backcountry. The program is divided into four geographically specific areas with the purpose of protecting rural backcountry parcels by allowing development rights to be voluntarily transferred from "sending" areas to the urban areas of the County or "receiving areas." In addition to the sending and receiving areas, the County has also identified neutral and optional areas, those that are either not suitable for sending or receiving development rights or those that are not eligible for receiving or sending density.

The Upper Blue Basin TDR Program began in 2000 and has successfully protected 1,415 acres, including 27 wetland lots of a total 14 acres. Owners of backcountry parcels voluntarily participate in the TDR program in exchange for giving up their right to develop a backcountry parcel for which they are monetarily compensated. When the property owner is compensated, the development rights are transferred into areas that can appropriately accommodate development, such as the Town of Breckenridge. Both County and town policies prohibit the upzoning of land or adding more units of density unless a TDR is acquired. To assist property owners in the TDR program a Joint Upper Blue TDR Bank was developed to bring prospective purchasers and sellers of TDRs together. The Bank is administered in coordination with the County and the Town of Breckenridge. One TDR is equal to 20 acres of backcountry property and is sold by the County for $92,590 as of January 2020. In 2018 the County transferred density from 324 acres equating to 25.93 development rights to the Town of Breckenridge.

3200 Rezoning Policies

Summit County has established policies that apply whenever a zoning amendment (rezoning) is proposed in the unincorporated area of the County. These Rezoning Policies are intended to ensure that land with development constraints is avoided in accordance with the policies contained herein, and that development contemplates and is designed in a manner consistent with the terrain and natural features of the site and is compatible with existing development in the vicinity.

- **3202.02 Development Constraints:** An applicant requesting a zoning amendment that may impact land with development constraints shall provide a surveyed existing conditions plan depicting all of the following constraints, unless the Planning Department waives mapping such environmental constraints:
  - 1. Slopes of greater than 30 percent.

  - 2. Areas subject to geologic hazards including avalanches, landslides, rock falls, mud flows, unstable slopes or soils, seismic effects, ground subsidence or radioactivity.
  - 3. Any regulatory floodway or flood fringe area as depicted on the County's Floodplain Overlay District Maps.

- **3202.05 Wildfire Hazard Areas:** Rezoning Policies for wildfire hazard areas state that in determining appropriate densities for a particular property, the Board of County Commissioners will take into account: 1) the wildfire hazard as identified in the Summit County Community Wildfire Protection Plan; 2) the potential impact to the public health, safety and welfare; 3) wildfire mitigation measures as required and/or allowed by the County; and 4) the proximity of the proposed development site to existing fire stations and the corresponding response zone and its inclusion in a designated fire protection district. Development projects seeking a zoning amendment shall ensure that wildfire hazard areas do not pose an undue risk to the public health, safety and welfare. As a part of a zoning amendment application, the County may require:
  - A. The submittal of a forest management plan approved by the Colorado State Forest Service that includes proposed mitigation for any wildfire hazard area.
  - B. Inclusion in a fire protection district or other arrangement for fire protection
  - C. Other measures as deemed necessary to reduce the wildfire hazard including consideration of the goals and policies set forth in the CWPP.

On January 9, 2018 the BOCC adopted Wildfire Mitigation/Forest Management amendments to the County's Rezoning Policies specific to wildfire hazard areas and mitigation with the following amendments:

- Include new requirements for assessing wildfire hazard within all four of the basin master plans,
- Assessing wildfire hazards and potential mitigation as part of any rezoning/PUD modification request
- Requirements for ensuring that full Zones 1 and 2 defensible space are incorporated into any new subdivision approval
- Changes to fencing requirement
- Prohibitions against the storage of firewood within Zone 1 during the fire season

Overlay Districts

4100 Floodplain Overlay District

The BOCC finds there are areas within Summit County subject to flooding which may cause serious property damage and threaten the health, safety and welfare of its residents. The imprudent use and occupation of these flood hazard areas will pose a continuing danger to life and property unless appropriate regulations are implemented concerning the use, development and occupation of these areas. The purpose and intent of these Floodplain Regulations is as follows:

- A. To reduce the hazard of floods to life and property through:
  - 1. Prohibiting certain uses that are hazardous to life or property in time of flood from locating in the floodplain;
  - 2. Restricting the development of certain uses in the floodplain that are hazardous to public health in time of flood;
  - 3. Restricting the development of certain uses in the floodplain which are especially susceptible to flood damage, so as to alleviate hardship and eliminate demands for public expenditures for relief and protection; and,

  - 4. Requiring permitted floodplain uses, including but not limited to public facilities that serve such uses, to be protected against floods by requiring floodproofing and general flood protection at the time of initial construction.

- B. To protect those who may occupy areas of the floodplain through:
  - 1. Regulating the manner in which structures and developments designed for human occupancy may be constructed and developed so as to minimize danger to human life within such structures;
  - 2. Regulating the method of constructing water supply and sanitation systems so as to prevent disease, contamination and unsanitary conditions resulting from inundation in time of flood;
  - 3. Regulating the location and method of constructing streets and bridges so as to prevent damage in time of flood; and,
  - 4. Requiring the provisions of this section and maps delineating floodplain areas be made available to the public so as to protect individuals from purchasing floodplain lands for purposes that are not suitable.

- C. To protect the public from the burden of avoidable financial expenditures for flood control and relief by regulating uses within floodplain areas so as to produce a method of construction and pattern of development which will minimize the probability of damage to property and loss of life or injury to the occupants of flood hazard areas.
- D. To protect and enhance the storage capacity of floodplains and to assure retention of sufficient floodway area to convey flood flows, which can reasonably be expected to occur by:
  - 1. Regulating filling, dumping, dredging, and alteration of drainage channels;
  - 2. Prohibiting excessive encroachments; and,
  - 3. Encouraging uses such as agriculture, recreation, and parking in floodplains.

The above regulations were reviewed and revised to conform with the updated State Floodplain Rules and Regulations that became effective statewide on January 14, 2011. The regulations were again revised to adopt the new maps prior to November 16, 2018. In 2019 FEMA and the CWCB visited with the Floodplain Manager and reviewed the existing regulations and practices. There are recommendations that will arise and be incorporated as a result of that meeting but have not yet been finalized as of the time of this plan.

Subdivision Regulations

Section 8100 Design Criteria and Required Improvements includes separate sections on Protection of the Natural Environment, Areas Subject to Environmental Hazard, Drainage, Fire Protection, and Soil Suitability criteria and requirements in new subdivisions.

Rural Land Use Subdivision (RLUS)

The Rural Land Use Subdivision encourages the efficient use of land through cluster development, the grouping or directing of new development to less sensitive areas within a subdivisions in order to protect environmentally sensitive lands including hazard prone areas. The County's RLUS regulations is intended to achieve the following goals:

- A. Implement goals of basin master plans and subbasin plans to protect the character of the County's rural areas.
- B. Provide incentives (e.g., simplified development review process, bonus densities) to landowners to choose the program rather than selecting other methods of land division
- C. Foster continued use of lands for ranching and agriculture
- D. Protect environmentally sensitive lands for ranching and agriculture

- E. Preserve open space
- F. Avoid disturbance of floodplains, steep slopes, and other geologically hazardous areas
- G. Preserve historic sites and structures
- H. Minimize visual impacts as seen from main public roads, when consistent with other goals
- I. Minimize extensive of roads and utilities
- J. Reduce exposure of new development to wildfire hazards.

Fire Hazard Mitigation Requirements for New Construction

Chapter 45 of the Summit County Building Code establishes minimum design and construction standards for the protection of life and property from fire within the wildland-urban interface. These provisions are meant to aid in the prevention and suppression of fires and lessen the hazards to structures from wildland fires as well as the hazards to wildlands from structure fires. New homes, additions and applications for building a new decks in any area in unincorporated Summit County must go through a wildfire mitigation inspection process.

Summit County Community Wildfire Protection Plan (CWPP), 2006, Readopted 2018

The purpose of the Summit County Community Wildfire Protection Plan is to establish a focused set of goals, policies, and implementation strategies specific to wildfire prevention and mitigation. The plan is a joint effort of the County, fire districts, State and Federal Forest Service, towns, the Northwest Colorado Council of Governments, and others. The document is organized into twelve sections and three appendices that include maps of focus areas for reducing wildfire risk and mitigation and implementation strategies. Appendix C details property specific implementation measures that support the goals of the overall document. The plan will be continuously updated. Since the plan's original adoption in 2006 the Wildfire Council and County staff continually review and refine the CWPP to meet the community's changing needs concerning wildfire protection. The plan has been revised in 2013 and again in 2018.

Evacuation Plan, 2020

The update to the Summit County Emergency Operations Plan in 2020 includes a new Functional Annex dedicated specifically to countywide evacuation. This plan will be all-hazards in nature and include evacuation plans and protocols for any incident requiring the protective order of evacuation.

Summit County Public Health Emergency Operations Plan, 2017

This plan was developed for the Summit County Public Health Department to promote a system to save lives, protect public health and the environment, alleviate damage and hardship, and to reduce vulnerability within Summit County. It provides guidance on overall emergency preparedness and concept of operations, roles, and responsibilities; Summit County Public Health Department emergency response organization; plan implementation process; and administrative, training, and exercising requirements.

Administrative/Technical Mitigation Capabilities

Table A-4 identifies the personnel responsible for activities related to mitigation and loss prevention in Summit County.

Table A-4 Summit County—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with Knowledge of Land Development/Land Management Practices	Yes	Planning Department Engineering Department	
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	Yes	Engineering, Building, Inspection Departments	
Planner/Engineer/Scientist with an Understanding of Natural Hazards	Yes	Engineering Department	
Personnel Skilled in GIS	Yes	GIS Department	
Full-Time Building Official	Yes	Building Inspection Department	
Floodplain Manager	Yes	Engineering Department/County Engineer	
Emergency Manager	Yes	County Manager's Office/Director of Emergency Management	Full-time
Grant Writer	No	Several departments have staff that write grants as part of their work, including Transit Summit Stage, Public Health, and Youth and Family Services	
Other Personnel	Yes	Sheriff's Office Fire Watch patrols	
Warning Systems/Services	Yes	Office of Emergency Management/Summit County 911 Center	Integrated Public Alert and Warning System for immediate public protective actions and SC Alert for emergency messaging and information.

The United States Geological Survey (USGS) provides real-time water data via their National Water Information System. Within Summit County, data from stream gauges detailed in Table A-5 are monitored for anomalies and potential flood conditions.

Table A-5 USGS Stream Gauges in Summit County

Station Name	Station Number
Monte Cristo Diversion (Hoosier Pass)	09041900
Bemrose-Hoosier Diversion (Hoosier Pass	09044300
McCullough Diversion (Hoosier Pass)	09044800
Blue River (Breckenridge)	09046490
Blue River (Dillon)	09046600
Snake River (Montezuma)	09047500
Keystone Gulch (Dillon)	09047700
Ten Mile Creek (Frisco)	09050100
Blue River (Below Dillon Dam)	09050700
Straight Creek (Dillon)	09051050
Elliot Creek Feeder Canal (Green Mtn. Reservoir)	09056500
Blue River (Below Green Mountain Dam)	09057500

Source: Summit County OEM

Fiscal Mitigation Capabilities

Table A-6 identifies financial tools or resources that Summit County could potentially use to help fund mitigation activities.

Table A-6 Summit County—Fiscal Mitigation Capabilities

Financial Resources	Accessible/ Eligible to Use
Community Development Block Grants	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
Fees for Water, Sewer, Gas, or Electric Services	No
Impact Fees for New Development	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activities	No
Withhold Spending in Hazard Prone Areas	Yes

The fiscal capabilities of Summit County have been significant for wildfire mitigation efforts. Summit County, in partnership with the Summit County Wildfire Council, has created a sustainable wildfire mitigation funding source and made great strides in fuels reduction projects in an effort to mitigate wildfire hazards; a direct result of the continued implementation of Summit County mitigation actions #2 and #3. In 2011 the Summit County Wildfire Council recognized that an unfulfilled funding need existed for projects identified in the Community Wildfire Protection Plan (CWPP) that did not meet the criteria for the State's Hazardous Fuels Reduction Grant Program. That recognition has led to the creation of the CWPP Implementation Grant Program. The County uses this program to provide funds or matching funds to leverage other wildfire mitigation grants. In 2018 and 2019, voters approved tax measures to continue

to fund wildfire prevention strategies, driven by the SCWC's implementation of the CWPP's goals and objectives. The tax measures allocate $500K annually, in perpetuity, and an additional $1M per year for a ten-year period (2018 - 2027). The County maintains an atlas of fuels reduction projects on its wildfire mitigation web page that is updated quarterly so that progress is documented on a regular basis. The Wildfire Council supports the concept of 'implementation' of the CWPP and funds not only defensible space projects, but hazard tree removal along right-of-way and bike paths, fire water storage systems, and comprehensive education programs.

Mitigation Outreach and Partnerships

Summit County is involved in the following mitigation related outreach programs and partnerships:

- Each spring, the governments of Summit County, Breckenridge, Dillon, Frisco, and Silverthorne distribute a packet of information to inform the communities about how to prepare for possible high water in May and/or June resulting from snowmelt.
- Wildfire mitigation work is a cooperative effort of the Summit County Government and the two fire districts: Red, White, and Blue Fire Protection District, and Summit Fire & EMS. The county has an appointed Wildfire Council, has adopted a Community Wildfire Protection Plan (CWPP), and for the past several years the Board of County Commissioners has dedicated funding for wildfire risk reduction projects.
- The County promotes fire education programs for the public and in schools.
- The Environmental Health Department regularly educates the public on disease prevention, including infectious disease and food safety.
- In February 2018 Summit County joined ongoing efforts with the non-profit High Country Conservation Center to develop and implement a climate action plan through the Summit Climate Action Collaborative. As part of the planning effort, an initial county-wide greenhouse gas (GHG) emissions inventory was completed. The plan has recommendations for reducing locally generated GHG emissions. Plan implementation will include working collaboratively with Xcel Energy, Mountain Parks Electric and other community partners.
- In 2018 the CSU Extension Program hosted 34 community education workshops, council and community presentation and field-based learning activities while partnering with similar organizations to promote forest health and wildfire preparedness.
- The Summit County Chipping Program helps property owners create defensible space by providing free chipping and disposal of branches, logs, and small trees. Property owner's clear woody vegetation around their homes and stack it into a slash pile for the county to chip it and haul it away for no cost.

Past Mitigation Efforts

Past mitigation efforts have focused on wildland-urban interface areas. The County has funded the following wildfire mitigation projects since 2006:

- Supplied $50,000 as seed money to stimulate and encourage fuel reduction efforts on private lands valued at over $200,000.
- Allocated $20,000 toward a forester position in cooperation with the state and federal forest services.
- Actively managed four of its open space properties to mitigate the impacts of mountain pine beetle infestation and improve forest health. Properties managed include Blue Danube, Iron Springs, Mesa Cortina/Wildernest Buffer, and Mesa Cortina Trailhead.
- Cut and removed 2,130 trees from County lands.

- Sprayed 8,730 trees on County lands and on important public rights of way.
- In 2018 alone the County funded 4 Hazardous Fuels Reduction programs for a total cost of $158,645, with a county contribution of $76,822.50 and funded 4 CWPP Implementation projects at a total project cost of $198,928 and a county contribution of $124,699.
- The 2019 Chipping Program resulted in a total of 1,931 households participating. Chipping crews removed 3,738 slash piles and approximately 5,400 cubic yards were moved to the Climax Molybdenum Mine for reclamation efforts.

The following mitigation efforts from stakeholders were noted by the HMPC as having reduced the risk hazards pose to the Summit County Community.

- Fuels reduction efforts and the creation of a 900-acre fuel break created by the U.S. Forest Service around a subdivision near Silverthorne and Buffalo Mountain Metropolitan District. The project area was tested during the June 2018 Buffalo Mountain Fire. While 1,400 homes were evacuated, the fuel breaks have been attributed by fire managers as a significant reason for why the homes in that subdivision did not burn in the fire. Firefighters were able to stop the fire within the fuel break without any damages to property, infrastructure or individuals.
- During 2018-early 2019, the county experienced a large number of avalanches that caused impacts to critical infrastructure including power lines and highways. Xcel Energy began burying utility lines during the recovery process, lessening future avalanche impacts to existing infrastructure.

Opportunities for Enhancement

The 2020 update provided the County an opportunity to review and update the capabilities currently in place to mitigate hazards. This also provided an opportunity to identify where capabilities could be improved or enhanced. Specific opportunities could include:

- Integrate risk assessment information into future updates to the County's Comprehensive Plan as well as updates to any of the four basin master plans.
- Develop and implement an IGA with incorporated communities related to the TDR Program similar to the existing IGA with the Town of Breckenridge.
- Update the list of projects in the County CWPP.

A.5 Goals and Objectives

Summit County adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

A.6 Mitigation Actions

The planning team for the unincorporated areas of the County identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

As part of its mitigation strategy, Summit County will continue to participate in and demonstrate compliance with the National Flood Insurance Program. This includes continuing to comply with the NFIP's standards for updating and adopting floodplain maps and maintaining and updating the floodplain zoning ordinance. Other details related to NFIP participation are discussed in the flood vulnerability discussion in Chapter 3.

Mitigation Action: Summit County—1 Vulnerable Populations

Jurisdiction:	Summit County
Action Title:	Coordinate vulnerable populations plans.
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	Summit County needs to improve planning for vulnerable populations during natural disasters and other emergency events. This work also needs to be done to fulfill national mandates to identify and support vulnerable populations during emergency events. It will help to improve coordination and prevent duplication of efforts and confusion.
Ideas for Implementation:	The Summit County Department of Human Resources will begin a process through the Community Inclusion Sub-Committee, of the Summit County Local Emergency Planning Committee, to identify the role and responsibility of County government departments with regards to support for vulnerable populations. The work will involve creating a collaborative of the multiple partners and stakeholders that each know and serve a portion of this population. This work needs to captured in a functional annex to the Summit County Emergency Operations Plan. Initial work in this area would identify immediate contact information so that an emergency could be handled immediately if necessary.
Responsible Agency:	Summit County Department of Human Resources
Partners:	Summit County Office of Emergency Management, Summit County Health Department, Summit County faith based organizations, Saint Anthony's Summit Medical Center, American Red Cross, as well as state and regional organizations
Potential Funding:	Summit County and jurisdictions
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Protect public health and safety • Reduce community impacts of disaster and emergencies
Timeline:	2021
Status:	A draft Functional Annex to the EOP is under development and is anticipated for adoption by the end of 2020.

Mitigation Action: Summit County—2 Summit County Wildfire Council

Jurisdiction:	Summit County
Action Title:	Support and participate in the Summit County Wildfire Council.
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	The Summit County Government has participated in the Summit County Wildfire Council from its inception. We have committed staff time and resources in the completion and updating of the plan and GIS products. We have supported the Council from the Board of County Commissioners by providing grant opportunities and project prioritization.
Ideas for Implementation:	The Council's responsibilities will need to extend for many years to come and will require part-time or full-time staff assignment.
Responsible Agency:	CSU Extension and Summit County Wildfire Council
Partners:	Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; Summit Fire and EMS and Red, White, and Blue Fire Protection Districts; U.S. Forest Service; and Colorado State Forest Service
Potential Funding:	Summit County
Cost Estimate:	$45,000
Benefits: (Losses Avoided)	• Improve communication and coordination • Protect public health and safety • Reduce wildfire risk through fuel reduction projects
Timeline:	Annual Implementation
Status:	Summit County Government and the CSU Extension Office strongly support the work of the Wildfire Council. The Council acts as the advisory board to the Board of Commissioners on all matters related to wildfire. The Council administers an approximate $350,000 budget for the local wildfire grant program, and public education. By 2019, nearly all of the attainable actions have been completed. The Summit County Wildfire Council will review and revise the action list to support ongoing community protection from wildfire efforts.

Mitigation Action: Summit County—3 Integration with Community Wildfire Protection Plan

Jurisdiction:	Summit County
Action Title:	Integrate wildfire mitigation strategies identified in the Summit County Community Wildfire Protection Plan (CWPP) into the multi-hazard mitigation plan.
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	Summit County recognizes that the CWPP is a subset of the broader multi-hazard mitigation planning effort. The HMPC is comprised of many of the same stakeholders as the group who developed and updated the CWPP.
Ideas for Implementation:	The HMPC will work to maintain and further integrate the wildfire mitigation strategies between the two plans so they complement one another, lead to coordinated efforts, and help to better position the County for future wildfire grant funding.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; Summit Fire and EMS, and Red, White, and Blue Fire Protection Districts; Summit County Wildfire Council; U.S. Forest Service; and Colorado State Forest Service
Potential Funding:	Summit County
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Improve communication and coordination • Reduce losses related to wildland-urban interface fires • Protect public health and safety
Timeline:	Annual Implementation.
Status:	Ongoing. This remains a priority and the 2020 plan update prioritize integration of all local plans

Mitigation Action: Summit County—4 Summit County Forest Health Group

Jurisdiction:	Summit County
Action Title:	Work with the Summit County Forest Health Task Force (formerly referred to as Mountain Pine Beetle Task Force) to strengthen public and stakeholder educational efforts.
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	The Summit County Forest Health Task Force has grown from a grassroots effort of business, citizens, and government to create a forum to discuss and understand the mountain pine beetle infestation and its impacts on communities in Summit County. The forum has a substantial following and plays a vital role in public and political education of these important issues. Education on mitigation activities that individuals can undertake is critical in a community that has a high number of vacation and second homeowners. The importance of education on local programs, defensible space, and funding opportunities is necessary to sustain focused attention by the public and government on this issue and its future ramifications.
Ideas for Implementation:	Summit County will continue to participate in and coordinate with the efforts of the Forest Health Group with a focus on improving public education. The importance of public education is critical to successful mountain pine beetle program implementation. The momentum established behind pubic and political education has grown to result in state and federal legislative attention and funding.
Responsible Agency:	Summit County Forest Health Task Force
Partners:	Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; Summit Fire and EMS and Red, White, and Blue Fire Protection Districts; Summit County Wildfire Council; U.S. Forest Service; and Colorado State Forest Service
Potential Funding:	Summit County
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Slow spread of invasive species infestation • Reduce losses related to wildland-urban interface fires • Provide public education about mitigation activities
Timeline:	Annual Implementation
Status:	Ongoing. Stakeholder involvement and participation is an important topic of Wildfire Prevention, Forest Health and Resilience is an ongoing effort. In addition to our connection with the Forest Health Task Force (FHTF), staff actively work with the Summit Association of Realtors (SAR), Open Space and Trails (OST: in the County and Town of Breckenridge), and have partnered with the Treasurer to include wildfire information in the annual Tax Mailer, to name a few. The Summit County Wildfire Council represents a number of additional partners.

Mitigation Action: Summit County—5 Vulnerability in Wildland-Urban Interface

Jurisdiction:	Summit County
Action Title:	Continue to enhance mapping of hazard and vulnerability analysis for wildland-urban interface areas of Summit County.
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	The Summit County Government GIS department has created digital mapping of the focus areas of highest concern for wildfire mitigation and fuel reduction efforts. Five categories were used to establish and identify the focus areas, and these were established in our first Community Wildfire Protection Plan and are updated annually. This information is used to specifically identify areas which receive our highest priority of work on the ground. We are sensitive to the importance of identifying the areas of highest vulnerability, which may be due to developed land use, critical infrastructure, or natural resources of high value.
Ideas for Implementation:	Data and mapping related to the wildland-urban interface fire hazard and vulnerability will be continually enhanced with the annual reviews of the Community Wildfire Protection Plan and will be integrated into the multi-hazard mitigation plan, when appropriate, and at each five-year update.
Responsible Agency:	Summit County GIS Department
Partners:	Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; and Summit Fire and EMS, and Red, White, and Blue Fire Protection Districts; Summit County Wildfire Council
Potential Funding:	GIS Department work time
Cost Estimate:	20-40 hours staff time
Benefits: (Losses Avoided)	• Slow spread of mountain pine beetle infestation • Reduce losses related to wildland-urban interface fires • Provide public education about mitigation activities
Timeline:	Annual Implementation
Status:	Ongoing. In 2016, the CWPP receive a 10-year update which included a comprehensive review and revision of the CWPP maps. With the addition of a dedicated Colorado State Forest Service (CSFS) staffer in Summit County, all project maps will be filed in a consistent manner and be reflective of projects funded with taxpayer monies.

Mitigation Action: Summit County—6 Wildfire Mitigation for Critical Facilities and Infrastructure

Jurisdiction:	Summit County
Action Title:	Identify and prioritize fuel reduction projects around critical facilities and infrastructure in wildfire hazard areas.
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	Areas of high wildfire risk are located throughout the County. Damage to critical facilities and infrastructure during wildfire events can greatly increase community losses and economic impacts.
Ideas for Implementation:	Summit County will work to continue identification and prioritization of critical facilities and infrastructure located in wildfire hazard areas. This action will include mapping of these facilities and comparison with the previously identified wildfire vulnerability focus areas.
Responsible Agency:	Office of Emergency Management, and GIS Department
Partners:	Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; and Summit Fire EMS, and Red, White, and Blue Fire Protection Districts; Summit County Wildfire Council, U.S. Department of Homeland Security Infrastructure Protection Division.
Potential Funding:	In 2018 and 2019, voters approved tax measures to continue to fund wildfire prevention strategies, driven by the SCWC's implementation of the CWPP's goals and objectives. The tax measures allocate $500K annually, in perpetuity, and an additional $1M per year for a ten-year period (2018 - 2027).
Cost Estimate:	Project costs are not yet known
Benefits: (Losses Avoided)	• Prevent loss of lifeline utility services • Protect critical facilities and infrastructure • Reduce losses related to wildland-urban interface fires
Timeline:	2021
Status:	**Completed - Continuing** This work was completed around schools and the hospital and is in a maintenance condition. As people continue to move into the WUI and development persists, new "critical facilities and infrastructure" warrant wildfire protection attention.

Mitigation Action: Summit County—7 DFIRM Adoption

Jurisdiction:	Summit County
Action Title:	Review and strengthen floodplain regulations when adopting new digital flood insurance rate maps (DFIRMs).
Hazard(s) Mitigated	Flood
Priority:	High
Issue/Background:	Summit County began the FEMA map modernization process in fall 2007 and preliminary DFIRMs are expected in fall 2008. The scheduled effective DFIRM date is fall 2009. Revised mapping became effective in November 2018.
Ideas for Implementation:	Once the new DFIRMs are reviewed, approved, and effective, Summit County will work with FEMA on changes needed to make the Summit County floodplain regulations compatible and in compliance with NFIP requirements and will adopt new maps.
Responsible Agency:	Summit County Engineering Department
Partners:	Colorado Water Conservation Board, FEMA
Potential Funding:	Summit County
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Reduce risk of property damage due to flood
Timeline:	November 2018
Status:	**Completed.** This action has been completed. Summit County will continue to comply with the NFIP and adopt new State of Colorado floodplain regulations.

Mitigation Action: Summit County—8 Incorporation into Master Plans

Jurisdiction:	Summit County
Action Title:	Incorporate information from the multi-hazard mitigation plan into community master plans.
Hazard(s) Mitigated	Multi-Hazard
Priority:	Medium
Issue/Background:	This action will help implement the plan's overall mitigation strategy and fulfill the requirement for incorporating the plan into existing planning mechanisms described in Chapter 5 Plan Implementation and Maintenance.
Ideas for Implementation:	During the updates for each of the five master plans in Summit County, the mitigation plan will be reviewed and incorporated into appropriate sections. Each of the master plans is updated every three to five years. This may involve a review of the mitigation plan's risk assessment to incorporate appropriate data and analysis and a review of common goals and objectives between the plans. This action will be incorporated into staff work plans.
Responsible Agency:	Summit County Planning Department
Partners:	Summit County Office of Emergency Management
Potential Funding:	Summit County
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Incorporation of mitigation plan into existing planning mechanisms • Improve coordination and communication
Timeline:	Annual Implementation
Status:	In progress - ongoing. The Planning Department continually incorporates many of the Multi-Hazard Mitigation Plan principles with the updates of each master plan.

Mitigation Action: Summit County—9 Roadside Ditch Erosion

Jurisdiction:	Summit County
Action Title:	Develop protection plan for roadside ditches to reduce erosion and flooding.
Hazard(s) Mitigated	Erosion/Deposition, Flood
Priority:	Medium
Issue/Background:	Steep roadways, natural surface ditches (as opposed to storm sewer systems) and the extensive use of traction sand during winter storms lead to erosion and significant sediment deposition as a result of seasonal runoff and summer rainstorms.
Ideas for Implementation:	Where practical, divert roadside drainage to natural drainage ways to minimize flow in the roadside ditches and reduce the loss of road and shoulder materials. Also add the appropriate armoring and sediment collection areas to existing systems.
Responsible Agency:	Summit County Road and Bridge Department
Partners:	
Potential Funding:	Summit County
Cost Estimate:	Unknown but is a part of the annual maintenance budget
Benefits: (Losses Avoided)	• Reduce damage due to erosion and flooding • Maintain safe roads
Timeline:	An ongoing maintenance issue
Status:	In Progress. This has been implemented in select locations where the problem has either been accelerated by storm events or where reconstruction projects have provided an opportunity and will continue to be implemented on future planned projects.

Mitigation Action: Summit County—10 Snake River Wastewater Treatment Plant Flood Protection

Jurisdiction:	Summit County
Action Title:	Enhance flood protection of the Snake River's collection system to prevent potential sanitary sewer overflows or inundation of critical facilities.
Hazard(s) Mitigated	Flood
Priority:	Low
Issue/Background:	Manhole lids, specifically those with large lifting holes, in low lying areas are more prone to flooding and water inflow through these holes. This can cause sanitary sewer overflows and damage critical facilities.
Ideas for Implementation:	Replace these with manhole lids with no such openings or holes.
Responsible Agency:	Summit County, Snake River Wastewater Treatment Plant
Partners:	
Potential Funding:	Summit County
Cost Estimate:	$1,000 total. Replacement cost for each manhole lid is approximately $100 times 10 manhole lids.
Benefits: (Losses Avoided)	Reduce the potential for sanitary sewer overflows into the watershed and reduce the chance of impacting critical facilities and avoiding any type of emergency bypass.
Timeline:	Completed in 2008.
Status:	**Completed**.

Mitigation Action: Summit County—11 NFIP Public Information

Jurisdiction:	Summit County
Action Title:	Improve education and information on the National Flood Insurance Program (NFIP) and flood hazard areas in Summit County.
Hazard(s) Mitigated	Flood
Priority:	Low
Issue/Background:	The Summit County website currently does not provide specific information on floodplain areas and special regulations in the County or the National Flood Insurance Program.
Ideas for Implementation:	Expand the Engineering Department website to include links to the new digital flood insurance rate maps (DFIRMs); local, state, and federal contacts; links to floodproofing methods; and minimum requirements for building in a floodplain. This project was updated in 2013 to include gaining an understanding of the implications of the Biggert-Waters Flood Insurance Reform Act of 2012. Work with FEMA and CWCB to understand the Reform Act and provide information to the public on how this might affect insurance rates, particularly those with second homes.
Responsible Agency:	Summit County Engineering
Partners:	Summit County Information Services and GIS departments
Potential Funding:	Summit County
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Improve public awareness of flood risks and mitigation measures. Better public information reduces phone calls and improves the questions that need answers.
Timeline:	Ongoing
Status:	In progress/Ongoing. The County had a Community Assistance Visit with FEMA in Fall of 2019 and discussed plans to improve NFIP-related press releases and communication through permit processes. County will assess additional opportunities that may arise.

Mitigation Action: Summit County—12 CWPP Inclusion of Water and Utility Focused Layers

Jurisdiction:	Summit County
Action Title:	CWPP inclusion of water and utility focused layer
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	The CWPP current data layer will be expanded to include a source water protection and utility infrastructure layer. This will assist with a more comprehensive understanding of the source water and utility infrastructure which could be impacted by wildfire.
Ideas for Implementation:	Incorporate into the current CWPP and Wildfire Council work. Review Blue River Watershed Assessment Report (2011) for applicable/related information
Responsible Agency:	Summit County Wildfire Council
Partners:	Wildfire Council, OEM, GIS, USFS, CSFS
Potential Funding:	Local funds, Grants
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Create an understanding of potential impacts from wildfire in the water basins of Summit County and lead to advanced or immediate actions to lessen water quality issues.
Timeline:	Completed as part of 2016 CWPP update
Status:	**Completed**. Action added in 2013. Understanding the basic geography of the County is a prerequisite to developing any effective strategy to reduce wildfire risk within a community. The CWPP base map contains the following data layers: 1. Basin Boundaries 2. Town Boundaries 3. Private Parcel Boundaries – with Summit County Assessor data for ownership 4. White River National Forest Lands 5. Wilderness Area Boundaries 6. Streams, Lakes, and Reservoirs 7. Fire Response Zones 8. Roads and Trails Centerline 9. Aerial Imagery from September 2010 10. Dip sites for Arial Resources 11. 10M Digital Elevation Model.

Mitigation Action: Summit County—13 Prepare a Hazard Information and Action Guide

Jurisdiction:	Summit County
Action Title:	Prepare a Hazard Information and Action Guide
Hazard(s) Mitigated	Multi-Hazard
Priority:	Medium
Issue/Background:	The Summit County Hazard Mitigation Plans contains a wealth of valuable information on multiple hazards. This information could be condensed into a public information brochure to inform the public on risks and ways to mitigate them.
Ideas for Implementation:	This project would create a Summit County specific public information and action guide.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	Summit County Wildfire Council, CSU Extension Office, Public Safety Agencies, and others.
Potential Funding:	Wildfire Council and grants
Cost Estimate:	$35,000
Benefits: (Losses Avoided)	The education of the public creates awareness and empowers the public to take action to mitigate loss and risk.
Timeline:	2014
Status:	**Completed.** Action added in 2013

Mitigation Action: Summit County—14 Conduct Public Education and Outreach Programs

Jurisdiction:	Summit County
Action Title:	Conduct Public Education and Outreach Programs
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	An informed public can help reduce hazard impacts through personal preparedness and mitigation.
Ideas for Implementation:	Conduct public education and outreach programs. Facilitate independent topic presentations based upon hazard as well as partner with other outreach groups to reach already established audiences.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	Summit County Wildfire Council, CSU Extension Office, Public Safety Agencies, Healthy Forest Task Force, Rotary Club of Summit County, and others.
Potential Funding:	Wildfire Council and grants
Cost Estimate:	$20,000
Benefits: (Losses Avoided)	The education of the public creates awareness and empowers the public to take action to mitigate loss and risk.
Timeline:	2016
Status:	**Completed - Continuing.** Action added in 2013

Mitigation Action: Summit County—15 Receive Storm Ready status from the National Weather Service

Jurisdiction:	Summit County
Action Title:	Receive Storm Ready status from the National Weather Service
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	The County is already doing some of the necessary elements to be designated 'Storm Ready' including warning and sheltering capabilities.
Ideas for Implementation:	Review Storm Ready requirements and work with the forecast office on the requirements.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	Summit County Communications Center
Potential Funding:	Not required
Cost Estimate:	N/A
Benefits: (Losses Avoided)	The review and update of the plans and procedures necessary to receive this rating will be beneficial. CRS participating communities could also earn additional credits from this designation.
Timeline:	2020-2023
Status:	Continue – not completed. Action added in 2013.

Mitigation Action: Summit County—16 Expand SCAlert Public Warning Groups

Jurisdiction:	Summit County
Action Title:	Expand SCAlert Public Warning Groups
Hazard(s) Mitigated	Multi-Hazard
Priority:	Medium
Issue/Background:	The SCAlert system is one emergency notification system to the public. The system has been active for 4 years and the group structure for messages needs to be expanded.
Ideas for Implementation:	The new groups to be added need to include alternative language groups and public information groups separated from emergency message groups.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	Summit County Communications Center, Summit County Public Information Officers Group; Buffalo Mountain Metro (See related action)
Potential Funding:	Not required
Cost Estimate:	N/A
Benefits: (Losses Avoided)	The relevance of the messaging system needs to be maintained in the public view. The system has over 11,000 subscribers. The updates to the system are based upon feedback on how to improve the usefulness.
Timeline:	2019
Status:	**Completed.** Action added in 2013. Multiple new group have been created and thousands of new subscribers have been added.

Mitigation Action: Summit County—17 Compost for Revegetation

Jurisdiction:	Summit County
Action Title:	Compost for revegetation – created by fuels reduction projects to help mitigate flood damage and erosion/deposition/water quality impacts
Hazard(s) Mitigated	Erosion/Deposition
Priority:	Medium
Issue/Background:	Erosion is a significant problem associated with wildfires, construction, and steep slopes in general. The most effective method of preventing erosion is to establish strong vegetative cover, which can be enhanced by the use of compost that is generated at the landfill using, in part, beetle-killed trees.
Ideas for Implementation:	Continue generating compost for use in revegetation projects. Regulations requiring the use of compost have been considered and may be added to the Summit County Land Use and Development Code if and where appropriate.
Responsible Agency:	Landfill
Partners:	Engineering/Planning/Road & Bridge/CDOT
Potential Funding:	n/a
Cost Estimate:	n/a
Benefits: (Losses Avoided)	Protects and enhances water quality
Timeline:	Ongoing
Status:	In progress. Action added in 2013.

Mitigation Action: Summit County—18 Property Protection and Home Construction

Jurisdiction:	Summit County
Action Title:	Wildfire, property protection, structural retrofits Non-Combustible roof replacement program
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	Wood shake-shingle roofs are a significant contributor to the loss of residential homes in wildfires that emit ember showers. This project would work with homeowners in the WUI to retrofit their roofs.
Ideas for Implementation:	Create a project when grant funds are available to assist homeowners with retrofit of roofing materials to class A non-combustible shingles.
Responsible Agency:	Summit County
Partners:	Building Inspection Office, Fire Districts
Potential Funding:	PDM Grant and local match
Cost Estimate:	$750,000 pilot project
Benefits: (Losses Avoided)	Property protection and wildfire damage mitigation
Timeline:	2017 and 2019
Status:	**Completed.** Action added in 2013. In 2019, the Building Code was revised, and adopted by the BOCC, to include WUI standards and the updated IAFC defensible space zones. In 2017, the Land Use and Development Code was revised and adopted to address master plan and subdivision standards as well as materials and landscaping requirements in relation to wildfire prevention.

Mitigation Action: Summit County—19 All-Hazards Warning System

Jurisdiction:	Summit County
Action Title:	All Hazards, Emergency Services, Hazard Warning Systems Cellular Service Improvement in the Lower Blue Valley
Hazard(s) Mitigated	Multi-Hazard
Priority:	Medium
Issue/Background:	The improvement of cellular service in the Lower Blue would improve the ability to notify and have reported emergency situations in the area. The public warning of emergency situations and the public's ability to report situations to the 911 Center are benefits to this project.
Ideas for Implementation:	Work with elected leaders and citizen groups to educate Cellular providers about the service gaps in the Lower Blue Valley. Suggest elected leadership at State and Federal level bring this situation to the attention of the FCC.
Responsible Agency:	Summit County
Partners:	Fire Districts, Friends of the Lower Blue, other homeowners in the area
Potential Funding: **Cost Estimate:**	Awards, Grants Unknown
Benefits: **(Losses Avoided)**	Protection of life safety, improved emergency response
Timeline:	Completed in 2018
Status:	**Completed.** FEMA approval of IPAWS alert and warning technology approved and implemented in 2018

Mitigation Action: Summit County—20 Culvert Replacement

Jurisdiction:	Summit County
Action Title:	Culvert Replacement
Hazard(s) Mitigated:	Flood
Priority:	Low
Issue/Background:	Culverts are undersized or deteriorating causing flooding on the Straight Creek and along other County creeks.
Ideas for Implementation:	Replace culverts with clear-span structures on Straight Creek and other creeks to mitigate flood risk.
Responsible Agency:	Summit County Road and Bridge
Partners:	
Potential Funding:	Staff Time/Dept. Budget, FEMA HMA Grants
Cost Estimate:	$300,000 - $500,000
Benefits: (Losses Avoided)	Increased drainage and resiliency of bridge infrastructure.
Timeline:	March 2024
Status:	New in 2020

Mitigation Action: Summit County— 21 Emergency Power

Jurisdiction:	Summit County
Action Title:	Emergency Power Study and Generator Installation
Hazard(s) Mitigated	Wildfire, Severe Winter Weather, Avalanche
Priority:	High
Issue/Background:	Power outages as a result of a severe winter storm, avalanche or wildfire could lead to the closure of governmental services making it challenging to assist citizens during an emergency or after a disaster.
Ideas for Implementation:	Commission a comprehensive power study for all County owned buildings to identify scope of work to update and install adequate backup power generation.
Responsible Agency:	Summit County Facilities Maintenance Department
Partners:	
Potential Funding:	Staff Time/Dept. Budget, FEMA HMA Grants
Cost Estimate:	$2,000,000
Benefits: (Losses Avoided)	Continuity of critical governmental services
Timeline:	March 2024
Status:	New in 2020

Mitigation Action: Summit County— 22 Emergency Shelter Enhancements

Jurisdiction:	Summit County
Action Title:	Emergency Shelter Enhancements
Hazard(s) Mitigated	Wildfire, Severe Winter Weather
Priority:	Medium
Issue/Background:	Shelters in Summit County are frequently used due to winter storm events; enhancements are needed to accommodate the increased use.
Ideas for Implementation:	Identify and implement enhancements to the primary emergency shelter at the Summit County Middle School to include showers, beds, blankets, pillows, storage rooms, laundering facilities, HEPA filters for HVAC (Heavy smoke events).
Responsible Agency:	Summit County Department of Human Services
Partners:	Red Cross
Potential Funding:	Staff time/Dep. Budget.
Cost Estimate:	$100,000
Benefits: (Losses Avoided)	Increased community resilience
Timeline:	March 2024
Status:	New in 2020

Mitigation Action: Summit County— 23 Evacuation Route Fuel Breaks

Jurisdiction:	Summit County
Action Title:	Fuel Break Along Evacuation Routes
Hazard(s) Mitigated	Wildfire
Priority:	Medium
Issue/Background:	Fuel breaks can help mitigate wildfire spread. Having these along evacuation routes also is important for public safety.
Ideas for Implementation:	Develop additional fuel breaks along road infrastructure that is used as evacuation routes. Identify and prioritize key routes for treatment.
Responsible Agency:	Summit County Road & Bridge
Partners:	Summit County Wildfire Council, Summit County OEM, jurisdictions
Potential Funding:	Summit County Wildfire Council
Cost Estimate:	TBD depending on the length of route for treatment.
Benefits: (Losses Avoided)	Maintenance of the integrity of evacuation routes during wildfire.
Timeline:	March 2024
Status:	New in 2020

Mitigation Action: Summit County— 24 HazMat Roadway Projects

Jurisdiction:	Summit County
Action Title:	Roadway Projects to Mitigate Hazardous Materials Transporation Accidents
Hazard(s) Mitigated	Hazardous Materials
Priority:	High
Issue/Background:	This project would mitigate areas prone to motor vehicle/hazardous materials transportation accidents.
Ideas for Implementation:	Strategic guardrail placements and truck ramp detention ponds w/inverted outlets.
Responsible Agency:	Summit County Road and Bridge
Partners:	Colorado Department of Transportation; Dillon Valley District
Potential Funding:	CDOT, FHWA
Cost Estimate:	$250,000
Benefits: (Losses Avoided)	Increased motorist and facility safety.
Timeline:	March 2024
Status:	New in 2020

Mitigation Action: Summit County— 25 Abandoned Mine Cleanup

Jurisdiction:	Summit County
Action Title:	Abandoned Mine Cleanup
Hazard(s) Mitigated	Hazardous Materials
Priority:	Medium
Issue/Background:	There is concern that a release of water from abandoned mines could contaminate local waterways.
Ideas for Implementation:	This project would identify mines with the potential for hazardous releases and prioritize them for cleanup.
Responsible Agency:	Summit County Environmental Health
Partners:	Colorado Department of Public Health and Environment. Private landowners
Potential Funding:	CDPHE, EPA
Cost Estimate:	$1-5 Million
Benefits: (Losses Avoided)	Prevention of long-term environmental degradation and increased sustainability of the drinking water supply.
Timeline:	March 2024
Status:	New in 2020

Mitigation Action: Summit County— 26 Supply Chain Study

Jurisdiction:	Summit County
Action Title:	Supply Chain Study
Hazard(s) Mitigated	Wildfire, Severe Winter Storm
Priority:	Medium
Issue/Background:	The impact of prolonged interstate closures on critical commodities such as food, fuel, propane, etc. is a growing concern as these incidents become more frequent.
Ideas for Implementation:	Engage stakeholders to commission a study related to the supply chain of goods into Summit County. This study would identify primary and alternate routes, and potential vulnerabilities in supply of commodities.
Responsible Agency:	Summit County Office of Emergency Management
Partners:	Local business and industry
Potential Funding:	General fund
Cost Estimate:	$40,000
Benefits: (Losses Avoided)	Increased community resilience and ability to better identify individual preparedness needs.
Timeline:	March 2024
Status:	New in 2020

Mitigation Action: Summit County— 27 Water Source Protection

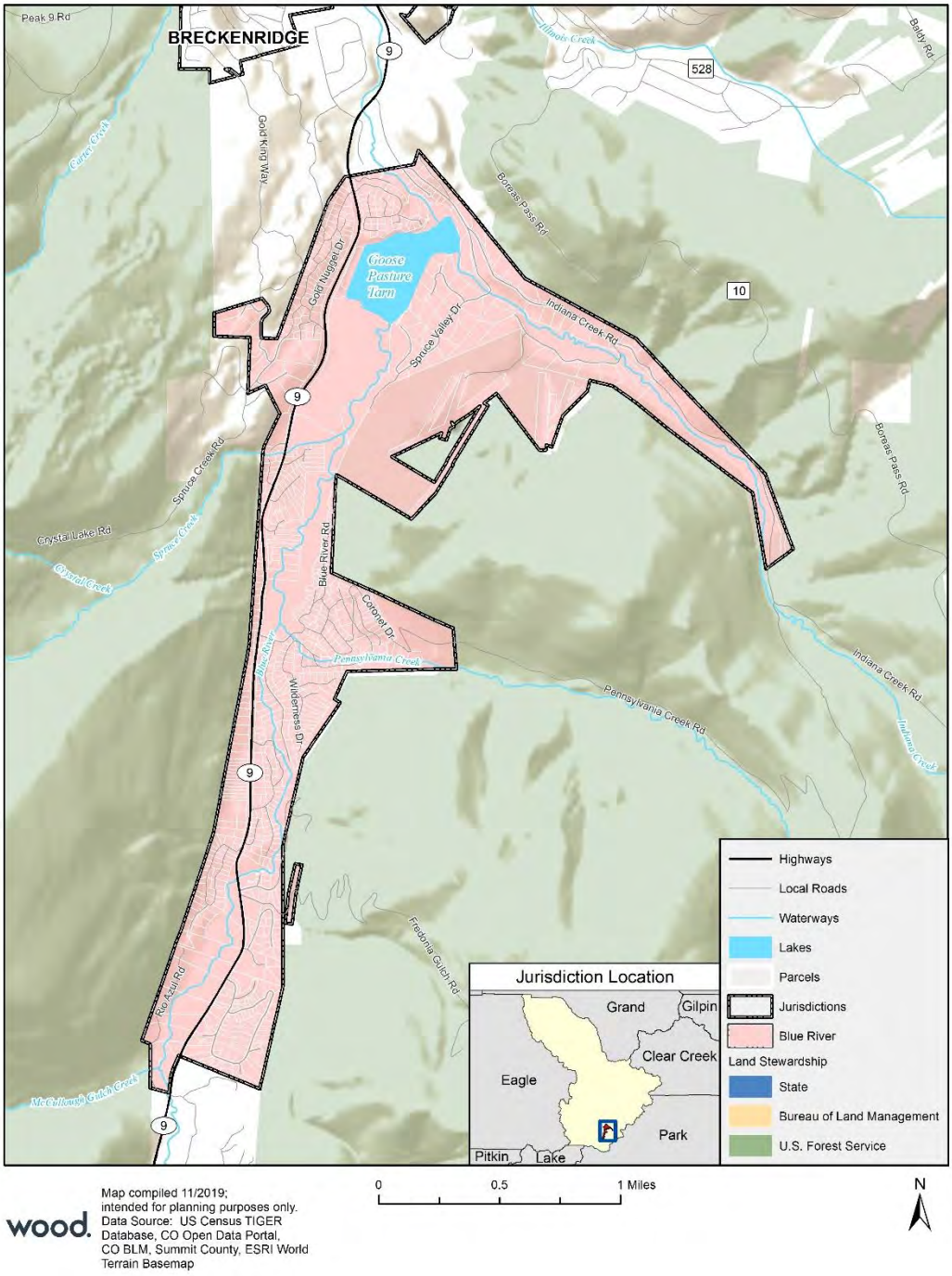
Jurisdiction:	Summit County
Action Title:	Water Source Protection
Hazard(s) Mitigated	Wildfire, Hazardous Materials, Avalanche
Priority:	Low
Issue/Background:	The County's water supply is vulnerable to multiple natural hazards including avalanche, rock/mud slides as well as hazardous material incidents on major highways.
Ideas for Implementation:	Water Source protection upgrades to prevent impact from to the water supply due to hazmat, avalanche, rock/mud slides along Hwy 91, I-70 (Ten Mile Canyon, Officers Gulch).
Responsible Agency:	Summit County Public Works
Partners:	Summit County Environmental Health
Potential Funding:	Summit County Capital Improvement Plan, EPA
Cost Estimate:	$100,000 – 1 million
Benefits: (Losses Avoided)	Increased sustainability of critical water supply.
Timeline:	March 2024
Status:	New in 2020

Annex B: Town of Blue River

B.1 Community Profile

Figure B-1 shows a map of the Town of Blue River and its location within Summit County.

Figure B-1 Town of Blue River



B.1.1 Geography

The Town of Blue River has a total area of 2.3 square miles. It is located along the Blue River approximately four miles south of the Town of Breckenridge at an elevation of 10,020 feet above sea level. Indiana Creek, Spruce Creek, Pennsylvania Creek, and McCollough Gulch Creek are all tributaries that flow into the Blue River (the main waterway) within Town.

B.1.2 Population

According to the Colorado State Demographer, the estimated 2018 population of Blue River was 926, a population change of 73 from the 2010 Census numbers although the exact number fluctuates from year to year. Select U.S. Census American Community Survey (ACS) demographic and social characteristics for Blue River are shown in the following tables and figures.

Table B-1 Blue River Demographic and Social Characteristics 2012-2017

Town of Blue River	2012	2017	% Change
Population	890	932	5%
Median Age	39.0	39.3	0.8%
Total Housing Units	732	738	0.8%
Housing Occupancy Rate	49.0%	35.4%	-27.8%
% of Housing Units with no Vehicles Available	0.00%	0.00%	0.0%
Median Home Value	$616,000	$605,500	-1.7%
Unemployment	11.5%	4.4%	-61.7%
Mean Travel Time to Work (minutes)	14.5	18.1	24.8%
Median Household Income	$87,426	$94,844	8.5%
Per Capita Income	$40,613	$50,376	24.0%
% Without Health Insurance	16.9%	13.3%	-21.3%
% of Individuals Below Poverty Level	11.0%	6.4%	-41.8%
# of Households	359	261	-27.3%
Average Household Size	2.48	3.11	25.4%
% of Population Over 25 with High School Diploma	98.2%	100.0%	1.8%
% of Population Over 25 with Bachelor's Degree or Higher	60.9%	55.2%	-9.4%
% with Disability	3.7%	3.3%	-10.8%
% Speak English less than "Very Well"	1.5%	0.0%	-100.0%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table B-2 Demographic and Social Characteristics Compared to the County and State

Demographic & Social Characteristics (as of 2017)	Blue River	Summit County	Colorado
Median Age	39.3	39.2	36.5
Housing Occupancy Rate	35.4%	30.80%	89.80%
% of Housing Units with no Vehicles Available	0.0%	1.60%	5.30%
Median Home Value	$605,500	$547,700	$286,100
Unemployment	4.4%	2.60%	5.20%
Mean Travel Time to Work (minutes)	18.1	16.4	25.2
Median Household Income	$94,844	$73,538	$65,458
Per Capita Income	$50,376	$37,192	$38,845
% Without Health Insurance	13.3%	21.40%	9.40%
% of Individuals Below Poverty Level	6.4%	10.30%	11.50%
Average Household Size	3.11	3.1	2.55
% of Population Over 25 with High School Diploma	100.0%	93.40%	91.10%
% of Population Over 25 with bachelor's degree or Higher	55.2%	47.80%	39.40%
% with Disability	3.3%	6.10%	10.60%
% Speak English less than "Very Well"	0.0%	7.50%	6.00%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table B-3 Demographics by Race and Sex

Blue River	Population	%
Total Population	932	
Male	354	48.2%
Female	381	51.8%
White, not Hispanic	704	95.8%
Hispanic or Latino	13	1.8%
Black	3	0.4%
Asian	0	0.0%
American Indian and Alaska Native	0	0.0%
Native Hawaiian and Other Pacific Islander	0	0.0%
Some other race	16	2.2%
Two or more races	3	0.4%

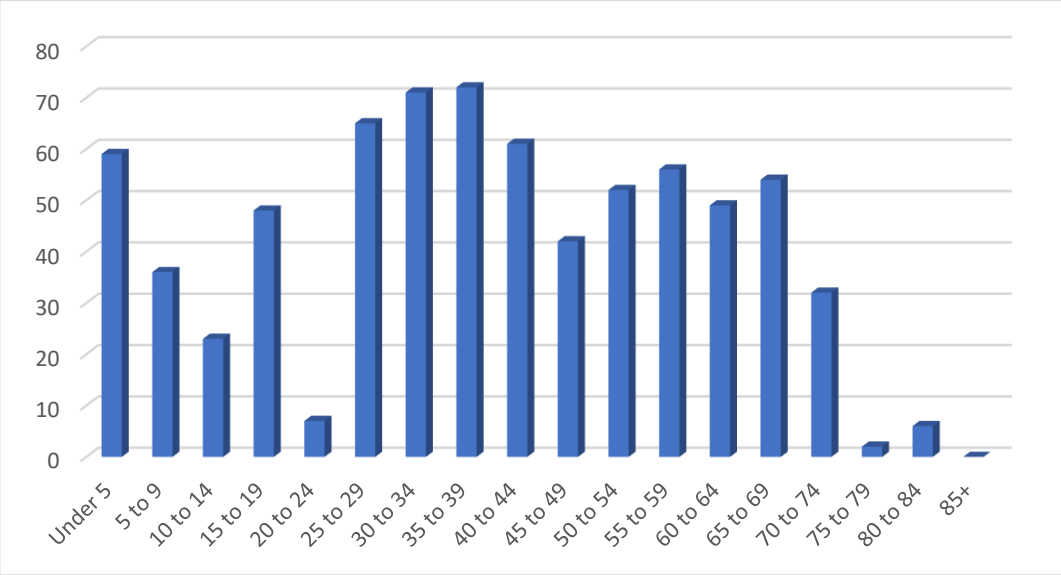
Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table B-4 Types and Total Amounts of Housing Units in Blue River

Type of housing units	Total	Percentage
Total housing units	738	
1-unit detached	644	87.3%
1-unit attached	31	4.2%
2 units	23	3.1%
3 or 4 units	0	0.0%
5 to 9 units	18	2.4%
10 to 19 units	15	2.0%
20 or more units	0	0.0%
Mobile home	7	0.9%
Boat, RV, van, etc.	0	0.0%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Figure B-2 Age Distribution in Blue River



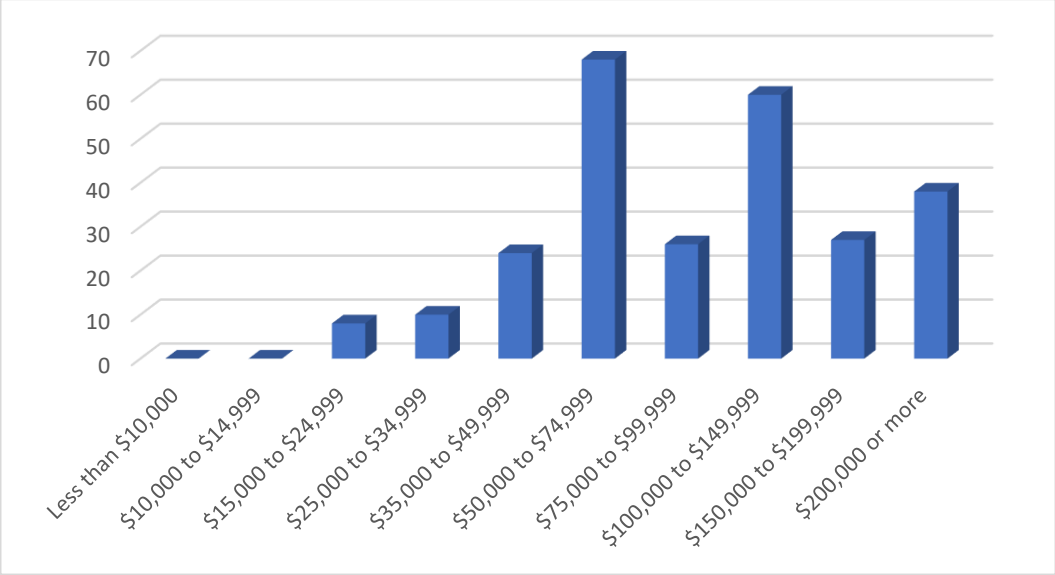
Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

B.1.3 Economy

The Town of Blue River is a residential community with little industry or commercial business. According to 2017 Census Bureau estimates, the industries that employed the highest percentages of Blue River's labor force were professional, scientific, management, administrative, and waste management services (25.2%); educational services, and health care and social assistance (18.4%); retail trade (11.8%); finance, insurance, real estate, and rental and leasing (9.4%); construction (9.2%); and arts, entertainment, recreation, accommodation, and food services (9.3%).

As shown in Table B-1, per capita income in Blue River was $50,376 in 2017, which is roughly 30% above average for both Summit County and the State of Colorado. A breakdown of Blue River's income distribution is shown in Table B-3.

Figure B-3 Income Distribution in Blue River as of 2017



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

B.2 Hazard Identification and Profiles

Blue River's HMPC identified the hazards that affect the community and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and overall significance specific to the Town (see Table B-5). In the context of the countywide planning area, there are no hazards that are unique to Blue River.

Table B-5 Blue River Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Unlikely	Limited	Low
Dam Failure	Large	Unlikely	Critical	Medium
Drought	Large	Occasional	Limited	Low
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Small	Likely	Critical	Medium
Flood	Small	Occasional	Limited	Medium
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Limited	Low
Landslide, Mudflow/Debris Flow, Rockfall	Small	Occasional	Limited	Medium
Lightning	Large	Likely	Limited	Low
Pest Infestation (Forest and Aquatic)	Small	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Likely	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

B.3 Vulnerability Assessment

The intent of this section is to assess Blue River's vulnerability to hazards separate from that of the planning area as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at for the more significant hazards or where available data permitted a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the main plan HIRA document.

B.3.1 Community Asset Inventory

Table B-6 shows the total number of improved parcels, properties, and their improvement and content values for the Town of Blue River. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, and 0% for Exempt parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table B-6 Blue River's Improved Parcel and Property Exposure

Parcel Type	Parcel Totals	Total Properties*	Improved Value	Content Value	Total Value
Exempt	41	42	$0	--	$0
Residential	721	758	$516,501,499	$258,250,750	$774,752,249
Total	762	800	$516,501,499	$258,250,750	$774,752,249

Source: Summit County Assessors Data, November 2019.

*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table B-7 lists summary information about the 9 critical facilities and other community assets identified by Blue River's HMPC as important to protect or provide critical services in the event of a disaster. Table B-8 details more information on the critical facilities in question found in the town and considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, to estimate whether it might be at risk of the various hazards assessed. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the main plan HIRA document.

Table B-7 Blue River Critical Facilities and Infrastructure Summary

FEMA Lifeline	Critical Facility Type	Total
Food/Water/Shelter	Static Water Structures	5
	Wastewater Facilities	1
Safety and Security	Fire Station	1
	Government Buildings	1
	Police Stations	1
TOTAL		9

Source: Summit County GIS, Summit County HMPC.

Table B-8 Detailed List of Critical Facilities and Infrastructure in Blue River

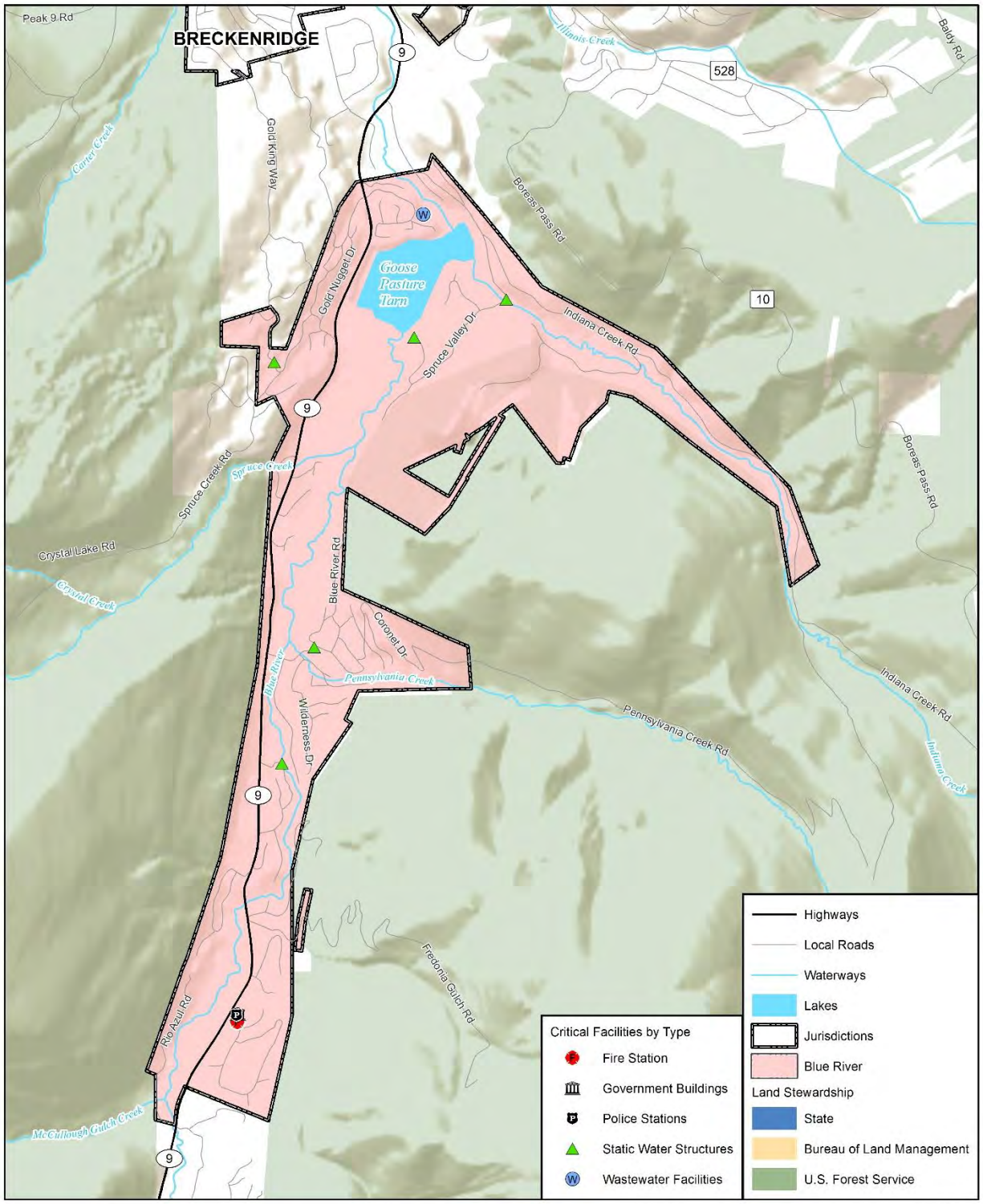
FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location	Notes or Additional Details
Food/ Water/ Shelter	Static Water Structures	Theobald Way Draft Point	Blue Grouse Trail	Access on both sides of stream, Distance = 10 Ft, Stream
		CR 801 Pond Draft Point	87 CR 801 "Purbin's House"	May be accessible off driveway with rig. Recheck in summer., Distance = 50 Ft, Pond
		Indiana Creek Draft Point	Spruce Valley Drive	Access on upside of road, Distance = 20 Ft, Stream
		Spruce Valley Tarn Access Draft Point	Spruce Valley Drive	Access is just past canoe house, may be accessible w/ type 6 as well, Distance = 100 Ft, Pond
		Blue River Rd Draft Point	Blue River Rd & Royal Drive	Water is available on W side of RD in a natural pool, Distance = 10 Ft, Stream
	Wastewater Facilities	Breckenridge Treatment Plant	--	--
Safety and Security	Fire Station	RWB Station 7	120 Whispering Pines Ln, Blue River 80424	--
	Government Buildings	Blue River Town Hall	--	$350,000 replacement value
	Police Stations	Blue River Marshall Office - Summit County Govt.	110 Whispering Pines Cir, Blue River 80424	--

Source: Summit County GIS, Summit County HMPC.

The past 2013 HMP noted the Town Park as a community asset with a $200,000 approximate replacement value.

The locations of identified critical facilities and infrastructure in Blue River are illustrated in Figure B-4.

Figure B-4 Critical Facilities and Infrastructure in the Town of Blue River



B.3.2 Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan.

- Drought
- Earthquake
- Erosion/Deposition
- Hazardous Materials (Transportation)
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Only Flood, Dam Inundation, Landslide/Mudflow/Debris Flow/Rockfall, and Wildfire hazards will be profiled in the following vulnerability assessment sections, due to the ability to quantify vulnerability further with available data.

Dam Failure

General Property

The Goose Pasture Tarn Dam is located in the Town of Blue River, on the north end, and has a maximum storage capacity of approximately 811 acre-feet. The Town also lies downstream of the Upper Blue Lake Dam, which is located near the Summit County and Lake County boundary, about 5 miles east of the Robinson Tailings Pond. The Upper Blue Lake Dam has a maximum storage capacity of approximately 2,100 acre-feet.

While there is no concrete data available to indicate any likelihood of failure, based on best available dam inundation data there might be structures potentially at risk of dam failure flooding. The dam failure inundation maps contain sensitive information and are not available for display in this public planning document. Based on a GIS analysis performed with the county parcel layer and the available dam inundation mapping (for planning purposes only), the following potential damages would be expected in Blue River. Note that additional details on the GIS analysis methodology, data preparation process, and other helpful information for understanding how vulnerability assessment results were obtained can be found in Section 3.3. Vulnerability Assessment within the main plan HIRA document.

Table B-9 Estimated Dam Inundation Risk to Properties in Blue River

Parcel Type	Total Properties Exposed	Improved Value	Content Value	Total Value	Population Exposed
Exempt	1	$0	--	$0	--
Residential	143	$72,556,720	$36,278,360	$108,835,080	443
TOTAL	144	$72,556,720	$36,278,360	$108,835,080	443

Source: Summit County GIS and Assessor's Office, U.S Census, Wood Analysis

People

Based on the GIS analysis summarized in Table B-9 above, it is estimated that around 443 people in Blue River might be at risk of dam inundation hazards. These totals were obtained by multiplying the average number of persons per household in Summit County (which equals 3.10) times the number of residential properties where dam inundation extents were available.

Critical Facilities and Infrastructure

Based on the critical facility inventory considered in the updating of this plan and intersected with the dam inundation extents available for the Town of Blue River, 2 critical facilities were found to be at potential risk. These are summarized in the table below.

Table B-10 Critical Facilities in Blue River at Risk of Dam Inundation

FEMA Lifeline Category	Critical Facility Type	Facility Name
Food/Water/Shelter	Static Water Structures	Theobald Way Draft Point
		Spruce Valley Tarn Access Draft Point
TOTAL		2

Source: Summit County, HIFLD, Wood Analysis

Economy

A dam inundation event that affected the major roads which give access to the town (e.g. Highway 9) could significantly affect the local economy, by limiting or completely impeding access to shops, restaurants, hotels, and other major industries which keep the local economy thriving.

Historical, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. For the most part the environment is resilient and would be able to rebound, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would.

Future Development

A dam failure would likely result in impacts greater than the 100- and 500-year flood events, as modeled by the latest FEMA NFHL data. The Town should consider dam failure hazards when permitting development downstream of the Goose Pasture Tarn and Upper Blue Lake Dams.

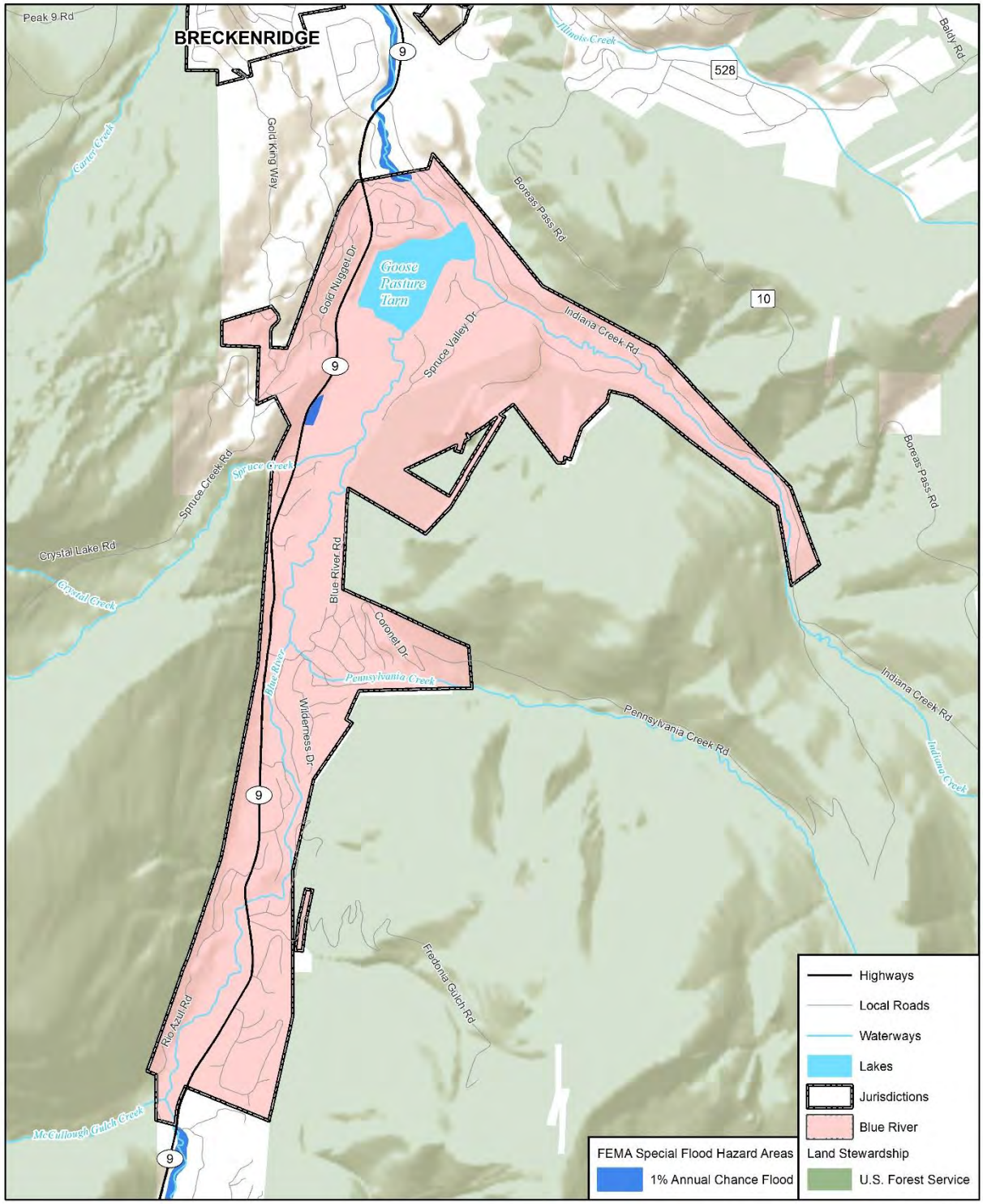
Flood

Though not fully delineated by the latest FEMA NFHL data (dated July 17, 2019), the Blue River is likely a cause for riverine flooding in the town, as it is the largest waterway crossing through it. Other streams which are present in Blue River include Pennsylvania Creek, Spruce Creek, Indiana Creek, and McCullough Gulch Creek, though flooding from these sources has not been included in the latest FEMA mapped areas and is hence not well known. However, the Goose Pasture Tarn Dam to the north of town reduces the peak discharge of the Blue River due to rainfall, but the effect is only marginal for runoff due to snowmelt, which is normally the major cause of peak flows. Other reservoirs provide only incidental flood protection (FEMA, 2018).

General Property

Vulnerability to flooding was determined by summing potential losses to Summit County's properties in GIS, by using the latest FEMA NFHL data along with the Summit County parcel layer the provided by the Assessor's Office. FEMA's NFHL data depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood areas. Figure B-5 below displays the FEMA special flood hazard areas present in the town, color coded based on flood event.

Figure B-5 FEMA Special Flood Hazard Areas in Blue River



Map compiled 12/2019;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, FEMA NFHL

Based on the GIS analysis performed with the county parcel layer and the available FEMA flood mapping, the potential risk for the Town is shown in Table B-10. Blue River's 1% annual chance flood zone shows that one residential structure is potentially at risk. No 0.2% annual chance flood zones are available in map form, and as such no exposure to this type of flooding was estimated using this methodology.

Table B-11 Summary of Properties Vulnerable to Flood in Blue River by Type

Flood Event	Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population
100-year	Residential	1	$942,742	$471,371	$1,414,113	$353,528	3

Source: Summit County, FEMA NFHL, U.S. Census Bureau, Wood analysis

People

The population exposed to the flood hazards described in the flood vulnerability analysis above was estimated by applying an average household size factor (based on 2018 U.S, Census estimates for Summit County, which equal to 3.1 persons per household) to the number of improved properties identified in the flood hazard areas within Blue River. Note that only those parcels of type Residential were used to estimate populations exposed. These estimates yielded the population exposures shown in the table above (Table B-10). As such, the 1% annual chance flood would potentially displace 3 people based on the single residential structure which falls in this flood zone.

Critical Facilities and Infrastructure

No critical facilities were found to overlap with the flood zones mapped for Blue River. The Town has experienced problems with collapsing culverts and the bridge over the Blue River on Blue River Road. This issue has been resolved by implementing a hazard mitigation project as described in Section B.6.

Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, and other downtime costs. Flooding often coincides with the busy summer tourism months in Summit County, and may impact, directly or indirectly (such as from the negative perception of potential danger to his hazard), the revenues of shops, restaurants, hotels, and other major industries which keep the local economy thriving. In addition, major flooding which led to road or other infrastructure closures could additionally limit access to the Town by tourists, locals, and even basic goods and services.

Historical, Cultural, and Natural Resources

The environment is mostly resilient to general flooding. However, cultural or historic properties within floodplains would be affected in similar ways as property and critical facilities/infrastructure, especially those with underground or basement levels where water would easily seep and potential ruin archives, resources, or other important assets.

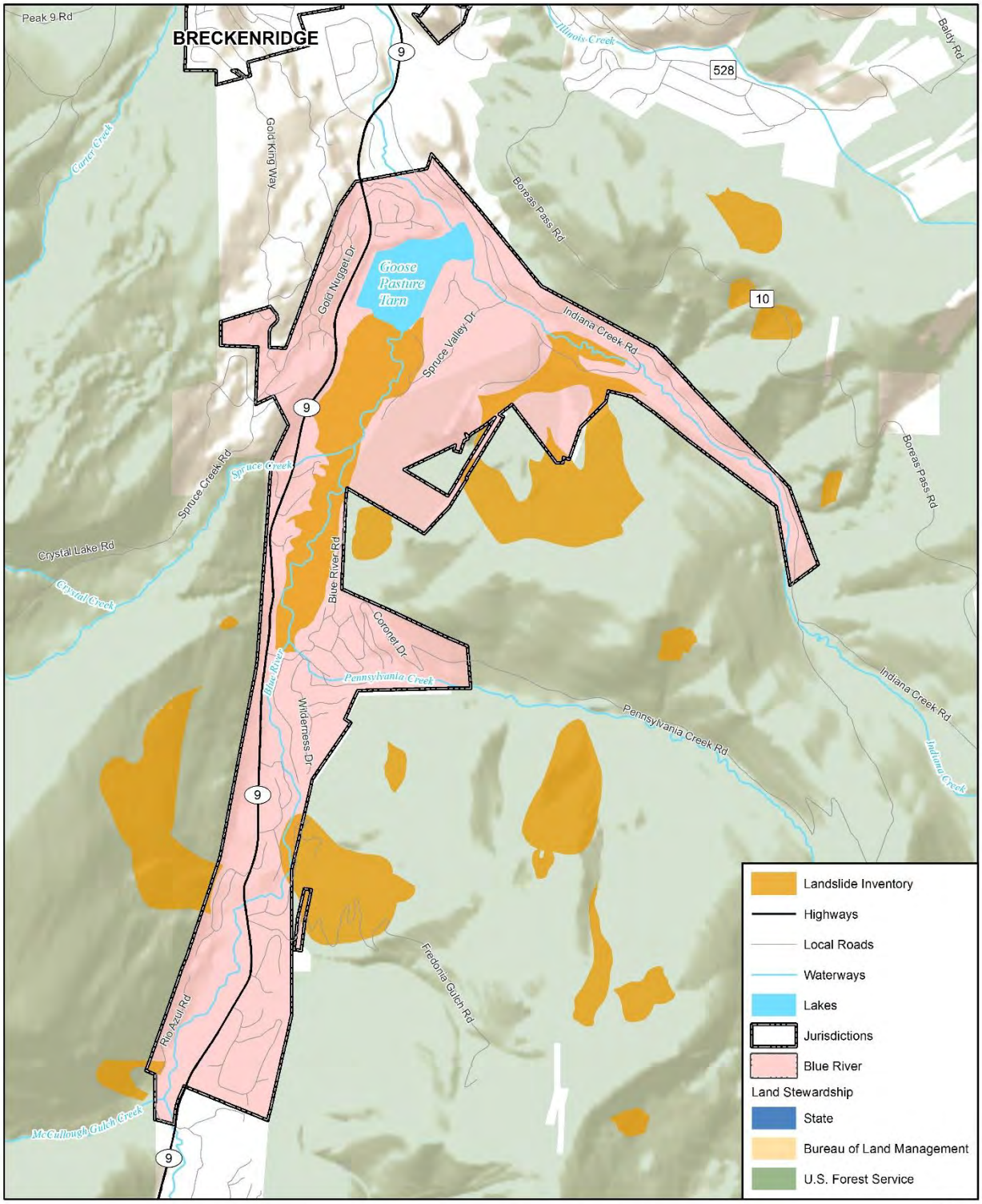
Future Development

Blue River does not have a floodplain ordinance but there is not anticipated to be new development in the small amount of mapped Special Flood Hazard Area. The building regulations do allow the Town to require that new construction meet certain drainage requirements at its discretion.

Landslide, Mud Flow/Debris Flow, Rock Fall

General landslide hazard areas are present in the Town of Blue River, particularly south of the Goose Pasture Tarn and along the Blue River, up until the Pennsylvania Creek merge. There are smaller hazard areas along Indiana Creek to the east of the town, and south of Wilderness Drive, east of Highway 9 towards Fredonia Gulch Road (see Figure B-6 below).

Figure B-6 General Landslide Hazard Areas in Blue River



Map compiled 11/2019;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CGS

General Property

Potential losses for general landslide areas were estimated using Summit County GIS and assessor's parcel data. Based on the GIS analysis performed, the potential risk to general landslide areas in Blue River is summarized in Table B-12. For the purposes of this analysis, if a parcel's centroid intersected the landslide hazard polygons, that parcel is assumed to be at risk. Content values were calculated from the improvements as a percentage of property improvement values based on their occupancy type (using FEMA Hazus guidance), so that Residential properties received content values worth 50% of their improvements. Property improvements and content values were then totaled to arrive at the Total Value column. Note that additional details on the GIS analysis methodology, data preparation process, and other helpful information for understanding how vulnerability assessment results were obtained can be found in Section 3.3. Vulnerability Assessment within the main plan HIRA document.

Blue River's Residential properties have a total exposure value of over $35.8 million. A total of 26 properties are exposed to these landslide hazards.

Table B-12 Property Exposure to General Landslide Hazard Areas in Blue River

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population
Residential	26	$23,906,229	$11,953,115	$35,859,344	81

Source: Summit County GIS/Assessor Office, Colorado Geological Survey, U.S. Census, Wood analysis

People

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways. Based on Table B-12 above, an estimated 81 people could be at risk of general landslide hazards in Blue River. At risk population was estimated by multiplying the average number of persons living in each household in Summit County (which is 3.1 per home) times the number of properties of type "residential" where landslide areas have been inventoried in Blue River.

Critical Facilities and Infrastructure

Only one critical facility is found at risk of landslide hazards in Blue River. It is the Spruce Valley Tarn Access Draft Point just past the canoe house south of the Goose Pasture Tarn, and it is classified as a static water structure. This facility is categorized under the Food/Water/Shelter FEMA Lifeline.

The major transportation route present in the town and hence key infrastructure allowing access in and out of it includes Highway 9. This route could be affected by the geologic hazards in question if closures were required, impeding the normal flow of goods and services, for example.

Economy

Economic impacts related to landslide, rockfall, debris fall, and mudslide hazards typically center around transportation routes temporarily closed by debris flow or other activity. The major route mentioned above (Highway 9) would be at most risk due to their heavy flow of goods, services, and populations which keep the economy thriving.

Historical, Cultural, and Natural Resources

As primarily natural processes, landslides and debris flows can have varying impacts to the natural environment as well as cultural or historical resources found on their path. For buildings and other structures, impacts would be similar as those seen on general property or critical facilities/infrastructure.

Future Development

The severity of landslide problems is directly related to the extent of human activity in hazard areas. Adverse effects can be mitigated by early recognition and avoiding incompatible land uses in these areas or by corrective engineering. The mountainous topography of Summit County and much of Blue River presents considerable constraints to development, most commonly in the form of steep sloped areas. These areas (defined as having a grade change of 30% or more) are vulnerable to disturbance and can become unstable.

Wildfire

General Property

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which breaks up areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in Blue River. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. From the improvement values were the content values calculated next, as a percentage of property improvement values based on their occupancy type (using FEMA Hazus guidance as follows): Residential parcels received content values worth 50% of their improvements, and Exempt parcels received content values worth 0% of their improvements. Property improvements and content values were then totaled to arrive at the Total Value column, which is also the estimated value at risk based on FEMA loss curve standards for wildfire hazards.

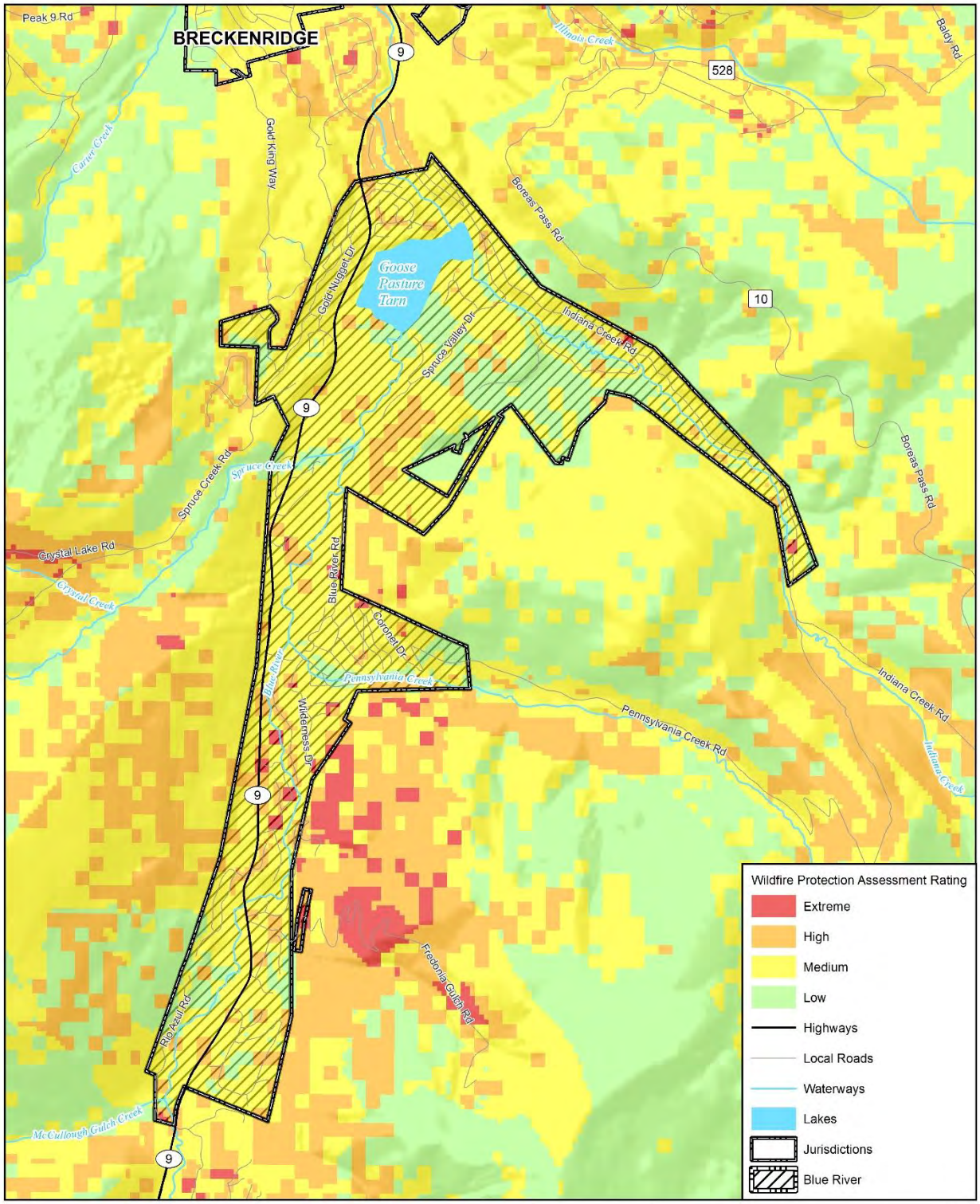
Wildfire protection assessment areas for Blue River are displayed in Figure B-7 for reference.

Table B-13 Property Values in Wildfire Zones by Parcel Type, Blue River

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Residential	689	$435,593,437	$217,796,719	$653,390,156	2,136
Exempt	4	$0	--	$0	--
TOTAL	693	$435,593,437	$217,796,719	$653,390,156	2,136

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis

Figure B-7 Wildfire Protection Assessment Areas and Ratings in Blue River



Map compiled 11/2019;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CO-WRAP

People

The last column of Table B-13 above summarizes the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted, Blue River has an estimated 2,136 people at risk of Medium, High, and Extreme rated wildfire zones. These totals were estimated by multiplying the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire zone/s. While this is higher than the actual population, it may also be indicative of the population that surges during the summer season.

However, smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

All 9 critical facilities located in Blue River are found in either Medium or High wildfire threat areas. Since all the facilities profiled in this plan update were already discussed in the Community Asset Inventory subsection of this annex, more details are available in Table B-7 and Table B-8. These are summarized again in the bullet points below for reference:

- Food/Water/Shelter
  - Static Water Structures: Theobald Way Draft Point, CR 801 Pond Draft Point, Indiana Creek Draft Point, Spruce Valley Tarn Access Draft Point, and Blue River Road Draft Point
  - Wastewater Facilities: Breckenridge Treatment Plant
- Safety and Security
  - Fire Station: RWB Station 7
  - Government Buildings: Blue River Town Hall
  - Police Stations: Blue River Marshall Office – Summit County Government

The Red, White, and Blue Fire Protection District, which provides fire protection services to Breckenridge, Blue River, and surrounding area, is considered an initial attack center for wildland fires on all private land and takes a joint responsibility with the U.S. Forest Service for fires on federal land.

Economy

Tourism, the accommodation and food services industry (e.g. hotels and restaurants), and retail are major components of Summit County's economy, and Blue River's as well. Wildland fires can, for example, lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation, stays in hotels, spending on restaurants and other commerce sources, and more.

Historical, Cultural, and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after the fire.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important historical assets in Blue River.

Future Development

New construction in Blue River must meet defensible space regulations, which is included in the Town's code.

B.3.3 Growth and Development Trends

Table B-14 illustrates how Blue River has grown in terms of population and number of housing units between 2012 and 2017.

Table B-14 Blue River—Change in Population and Housing Units, 2012-2017

2012 Population	2017 Population Estimate	Estimated Percent Change 2012-2017	2012 # of Housing Units	2017 Estimated # of Housing Units	Estimated Percent Change 2012-2017
890	932	5%	732	738	+0.8%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

The Town of Blue River Comprehensive Plan states:

> Blue River is a unique municipality in that it encompasses only residential subdivisions and has no commercial uses that typically define downtowns or commercial corridors in other communities. Adding to its uniqueness is the fact that approximately 44% of the homes in the town are utilized as part-time residences or vacation homes (Census Bureau). For the most part, the full-time residents in Blue River are employed and commute to work in other communities, as evidenced by the 89% workforce participation rate and median household income of $78,000 per year, both of which are higher than other comparable small towns in the area including Frisco, Dillon and Fraser (Census Bureau).

B.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into four sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

B.4.1 Regulatory Mitigation Capabilities

Table B-15 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Blue River.

Table B-15 Blue River—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	Covered by Joint Upper Blue Master Plan (2011)
Zoning Ordinance	Yes	Chapter 16 of Town Ordinances
Subdivision Ordinance	Yes	Chapter 17 of Town Ordinances
Growth Management Ordinance	Yes	Addressed in Comprehensive Master Plan
Floodplain Ordinance	No	
Other Special Purpose Ordinance	Yes	Wildfire mitigation standards

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Building Code	Yes	2018 International Residential Code adopted in 2019
Fire Department ISO Rating	Yes	Rating: 2
Erosion or Sediment Control Program	Yes	Coordinating on this category and Stormwater with the Upper Blue Sanitation District. As sewer projects are being conducted the Town replaces culverts and drainage control measures
Stormwater Management Program	Yes	See above statement
Site Plan Review Requirements	Yes	Architectural Guidelines
Capital Improvements Plan	Yes	Capital Improvement Plan (2018)
Economic Development Plan	Yes	Included in Comprehensive Master Plan
Local Emergency Operations Plan	No	Update in progress with other Municipalities
Other Special Plans	Yes	Defensible space plans being developed
Flood Insurance Study or Other Engineering Study for Streams	No	Contract with water specialist and looking at future water projects

Town of Blue River Comprehensive Plan

The Town's Comprehensive Plan contains existing hazard mitigation capabilities via goals and strategies such as Goal 11, aimed at reducing the risk of wildfire hazards particularly associated with the local conifer forests. Thinning of vegetation around and near structures is noted as helping to reduce wildfire risk, as well as establishing and maintaining fire breaks. The three strategies contained within this goal are as follows:

- Strategy A: Work with the Red White and Blue Fire Protection District to attain "Fire Wise" status for Blue River
- Strategy B: Improve the Town addressing system and address signage standards for faster and more efficient EMS response
- Strategy C: Develop a program and funding for ware cisterns for fire protection

Town of Blue River Ordinances

Chapter 7 Health, Sanitation, and Animals

The purpose of Division II Forest Management of Article V Trees is to preserve the rural mountain character of the Town by minimizing the removal of live trees while protecting the life and property of the residents of the Town by establishing minimum wildfire mitigation standards. These include defensible space regulations for new construction.

Chapter 16 Zoning

Sec. 16-6-50. Site and structure requirements.

a) Density. The applicant shall be responsible for justifying the proposed density level in terms of land planning and physiographic data, but in no case shall the gross density exceed six (6) dwelling units per acre of land.

b) Yard requirements. Yard requirements will be determined upon submission and approval of the preliminary development plans. The applicant shall be responsible for justifying the proposed yard requirements in terms of land planning and fire safety.

c) Height requirements. The maximum height of structures must be approved by the Planning and Zoning Commission upon review of each planned residential development in relation to the following factors:

1) Geographical position.

2) The probable effect on surrounding slopes and hills.

3) Adverse visual effects imparted to adjoining property owners, other areas of the development, public lands or public rights-of-way.

4) Potential problems for adjacent sites, both within and out of the development, caused by shade, shadows, loss of air circulation or loss of view.

5) Surrounding traffic conditions and lines of sight.

6) Uses within each building.

7) Fire prevention measures. (Prior code 6-6-4)

Sec. 16-8-80. Compliance with Building and Fire Codes.

Where approval of an accessory apartment is sought by an owner for a unit existing before adoption of this Article, the unit shall be inspected and shall comply with applicable requirements of the Building and Fire Codes1. (Prior code 5-5-8)

Chapter 18 Building Regulations

Prior to the issuance of a certificate of occupancy, any person who builds or erects any structure must contact the Town by calling or writing the building inspector to obtain approval for issuance of the certificate of occupancy. Approvals of the septic/sewer authority, the fire protection district, the Architectural Review Board, and homeowners' association may be required. Approval may, at the Town's sole discretion, require completion of the following improvements:

- Installation of culverts
- Grading or regrading any disturbed or damaged roads or driveways or other areas necessary for proper drainage
- All runoff created by or redirected by the construction, erection and landscaping of the structure on the property shall be treated, contained, and controlled so that there are no increases in runoff or other drainage consequences resulting from said construction, erection, and landscaping

Floodplain Regulations and NFIP Participation

There are limited flood areas mapped in Blue River, as indicated by the most current FEMA National Flood Hazard Layer data (November 2018). The Town of Blue River does not participate in the NFIP as of September 12, 2019 and has been sanctioned since 11/16/12. According to the HMPC, due to limited impacts from flooding and the cost of enforcement the Town has opted not to participate. This means

[1] See Chapter 18 of this Code.

that the community has a mapped special flood hazard area but is not regulating development in those areas and flood insurance is not available for residents that may choose to have it.

B.4.2 Administrative/Technical Mitigation Capabilities

Table B-16 identifies the personnel responsible for activities related to mitigation and loss prevention in Blue River.

Table B-16 Blue River—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with Knowledge of Land Development/Land Management Practices	Yes	Land Planner	Contract position
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	Yes	Building Inspector	Full time position with Town
Planner/Engineer/Scientist with an Understanding of Natural Hazards	Yes	Engineer	Contract Position
Personnel Skilled in GIS	No		Utilize Summit County GIS
Full Time Building Official	Yes	Building Inspector	
Floodplain Manager	No		Handled by contract Engineer
Emergency Manager	Yes	Town Manager	Town Manager fulfills these duties
Grant Writer	Yes	Town Manager	Town Manager fulfills these duties
Other Personnel	Yes	Town Manager/Clerk	
Warning Systems/Services	Yes		Provided by Summit County Communications Center

B.4.3 Fiscal Mitigation Capabilities

Table B-17 identifies financial tools or resources that Blue River could potentially use to help fund mitigation activities.

Table B-17 Blue River—Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	No	
Capital Improvements Project Funding	No	
Authority to Levy Taxes for Specific Purposes	Yes	
Fees for Water, Sewer, Gas, or Electric Services	No	
Impact Fees for New Development	Yes	
Incur Debt through General Obligation Bonds	Yes	
Incur Debt through Special Tax Bonds	Yes	
Incur Debt through Private Activities	No	
Withhold Spending in Hazard Prone Areas	Yes	

B.4.4 Mitigation Outreach and Partnerships

Blue River continues to partner with the Red, White, and Blue Fire Protection District to implement defensible space projects for property owners to reduce wildfire risk. The Town plans to continue this program in the future and has maintained a wildfire mitigation budget line for the purpose of matching grants.

B.4.5 Past Mitigation Efforts

The Town of Blue River in partnership with Red, White & Blue; Summit Wildfire Council and a private contractor has worked to provide defensible space grants to encourage residents to create defensible space around their homes. In addition, the Town has, with assistance from DOLA and Summit Wildfire Council in partnership with Red, White & Blue Fire District installed cisterns in 21 locations throughout Town to allow for enhanced fire response.

B.4.6 Opportunities for Enhancement

Based on the capability assessment, Blue River has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the Town to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM. Additional training opportunities will help to inform Town staff and board members on how best to integrate hazard information and mitigation projects into the Town policies and ongoing duties of the Town. Continuing to train Town staff on mitigation and the hazards that pose a risk to the Town will lead to more informed staff members who can better communicate this information to the public.

B.5 Mitigation Goals and Objectives

Blue River adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

B.6 Mitigation Actions

The planning team for Blue River identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: Blue River—1 Culvert and Bridge Replacement

Jurisdiction:	Town of Blue River
Action Title:	Replace collapsing culverts and rebuild bridge over the Blue River on Blue River Road.
Hazard(s) Mitigated:	Flood
Priority:	High
Background/Issue:	
Responsible Agency:	Town of Blue River Town Management
Partners:	Summit County
Potential Funding:	Town of Blue River, FEMA Hazard Mitigation Grant Program and Pre-Disaster Mitigation Grant Program
Cost Estimate:	$300,000
Benefits: (Losses Avoided)	• Protect public health and safety • Reduce damage due to flooding • Prevent bridge collapse • Improve evacuation routes
Timeline:	--
Status:	**Completed**. This is complete and culverts are cleared on an annual basis to ensure functionality

Mitigation Action: Blue River—2 Defensible Space Program

Jurisdiction:	Town of Blue River
Action Title:	Continue homeowner defensible space program begun in 2007
Hazard(s) Mitigated:	Wildfire
Priority:	High
Background/Issue:	Forest pests has killed many trees in town increasing the wildfire danger. As we are told by the fire district, it is not if, but when a wildfire will break out. The Town of Blue River has embarked on a defensible space program to help with fire mitigation. The Town has had the program in place since 2007. We also now have hydrants in the Town.
Ideas for Implementation:	Encourage homeowners and property owners to clear a 30-foot defensible space around their homes through education and rebates. Seek funding to continue this program each year.
Responsible Agency:	Town of Blue River Town Management
Partners:	Red, White, and Blue Fire Protection District
Potential Funding:	Town of Blue River, grant from Red, White, and Blue Fire Protection District, FEMA Hazard Mitigation Grant Program and Pre-Disaster Mitigation Grant Program
Cost Estimate:	We have budgeted (the Town) $15,000 with a matching grant from Red, White and Blue Fire Protection District for $15,000.
Benefits: (Losses Avoided)	• Help residents take responsibility for mitigation of their homes • Reduce potential loss of life and structures
Timeline:	Annual Implementation
Status:	The Town provides funding each year towards the defensible space grant program in conjunction with the Summit County Wildfire Council.

Mitigation Action: Blue River—3 Regrade Spruce Creek Road

Jurisdiction:	Town of Blue River
Action Title:	Re-grade Spruce Creek Road to allow safe automobile passage to homes and national forest trails
Hazard(s) Mitigated:	Erosion/Deposition, Flood
Priority:	Low
Background/Issue:	The current road is being washed away. Complete re-engineering is required to bring it up to a safe standard. This is a major thoroughfare into the National Forest and is heavily used. If the Town deems it unsafe and we cannot get it repaired, we will have to close the road for safety reasons.
Ideas for Implementation:	We have approached the county for assistance since our Town road connects with the County and on to the National Forest.
Responsible Agency:	Town of Blue River Town Management
Partners:	Summit County
Potential Funding:	--
Cost Estimate:	It has been estimated at $1,000,000 to reconstruct the road.
Benefits: (Losses Avoided)	• Ensure safety of road for residents and visitors to the national forest. • Avoid closing the road.
Timeline:	--
Status:	**Completed**. The road was addressed as best possible given funding and terrain. Safety of this road is addressed in the Blue River Capital Improvement Plan and will be completed as funding is available.

Mitigation Action: Blue River—4 Augment Water Supply

Jurisdiction:	Town of Blue River
Action Title:	Structural Project – Augment water supply – Cistern Project
Hazard(s) Mitigated:	Wildfire
Priority:	High
Background/Issue:	The Town intends to purchase land to install cisterns in strategic locations for wildfire and structure protection.
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	Red, White and Blue Fire Protection District, Wildfire Council
Potential Funding:	Grants, Awards, Town funds
Cost Estimate:	$100,000 for each system, plus land acquisition costs
Benefits: (Losses Avoided)	There are few hydrants throughout the jurisdiction and firefighting requires shuttling water with tenders. The additional water would be a benefit in initial attack of a wildfire or structure fire or structure protection.
Timeline:	--
Status:	**Completed**. Action added in 2013. Cisterns have been installed in 21 locations throughout town. As easements are granted and requests submitted, additional cisterns will be installed per the capital improvement plan.

Mitigation Action: Blue River—5 Comprehensive Master Plan

Jurisdiction:	Town of Blue River
Action Title:	Prevention– Comprehensive Master Plan
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Medium
Background/Issue:	The Town is in the process of developing a comprehensive master plan. The plan includes annexation and tax alternatives.
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	Summit County Planning
Potential Funding:	Town funds
Cost Estimate:	Staff Time
Benefits: (Losses Avoided)	The plan will provide the Town with a comprehensive planning strategy for the future.
Timeline:	2-5 years. The Plan was adopted in 2015 and is being updated in 2020.
Status:	In progress. Action added in 2013. In 2019 the Town completed and adopted the capital improvement plan. This plan is being utilized and a planning document and the town is working towards funding the plan as part of a long-term project. In 2020 the Town will be updating the 2014 Comprehensive Plan.

Mitigation Action: Blue River—6 Realign Spruce Creek Road

Jurisdiction:	Town of Blue River
Action Title:	All Hazards – Structural Project – Re-alignment of Spruce Creek Road with Colorado Highway 9
Hazard(s) Mitigated:	Multi-Hazard
Priority:	High
Background/Issue:	The Town is looking into a seasonal closure as one alternative to addressing the safety hazard at the Spruce Creek Road and Highway 9 intersection. A second alternative would be the permanent closure of the intersection. A third alternative would be the re-alignment of the intersection with the State Highway.
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	Colorado Department of Transportation
Potential Funding:	Grants, Awards, State and Town funds
Cost Estimate:	
Benefits: (Losses Avoided)	The intersection is a blind entrance point onto Highway 9 where the posted speed limit is 50 mph. During the winter months the weather elements cause motorists to slide into the intersection as well as having extreme difficulty in climbing up the grade on Spruce Creek Road from the highway. This is dangerous because of the grade, road construction material, and weather elements.
Timeline:	--
Status:	**Completed.** Action added in 2013. Safety mirrors are being installed.

Mitigation Action: Blue River—7 Develop Emergency Plan for Highway Closures

Jurisdiction:	Town of Blue River
Action Title	Emergency Plan for Highway Closures
Hazard(s) Mitigated:	Multi-Hazard
Priority:	High
Background/Issue:	When I-70 is closed, traffic is diverted through the Town of Blue River along Hwy 9 to Hoosier Pass. In cases of inclement weather, we lack a plan to address traffic back up, accidents and overall mitigation including resources. A plan needs to be developed outlining protocols and procedures including how to address safety closures of Hwy 9
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	Summit County OEM, Summit County Sheriff's Office, Colorado State Patrol, Colorado Department of Transportation
Potential Funding:	Grants, Awards, State and Town funds
Cost Estimate:	$0
Benefits: (Losses Avoided)	With a plan in place, we will be able to prevent and/or respond better to accidents and safety concerns along Hwy 9.
Timeline:	Spring 2020
Status:	New in 2020

Mitigation Action: Blue River – 8 Fuel Reduction and Fuel Breaks

Jurisdiction:	Town of Blue River
Action Title:	Fuels reduction and creation of a break area on National Forest Service and County land that borders the Town of Blue River
Hazard(s) Mitigated:	Wildfire
Priority:	High
Background/Issue:	The Town of Blue River has worked diligently to encourage defensible space around private property within the Town limits. The area that surrounds the Town is both County and National Forest that is in need of fuels reduction to create a healthy forest and buffer in case of a wildfire.
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	Summit County Wildfire Council, USFS
Potential Funding:	HMA Grants, HMGP -Post Fire following FMAG, County
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	By conducting a fuels reduction along the Town borders, it will increase the ability to effectively protect the Town and properties in case of a wildfire.
Timeline:	2021
Status:	New in 2020

Mitigation Action: Blue River – 9 Bury Utilities

Jurisdiction:	Town of Blue River
Action Title:	Work to bury utilities throughout Town
Hazard(s) Mitigated:	Multi-Hazard, Wildfire, Severe Weather
Priority:	Medium
Background/Issue:	Electrical lines are currently above ground within Town limits. This exposes the Town to power outages and potential fire risk during inclement weather.
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	Xcel Energy, Comcast
Potential Funding:	HMA Grants
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	By burying the lines, this will assist in protecting vital communication lines and power.
Timeline:	2023
Status:	New in 2020

Mitigation Action: Blue River – 10 Implement Capital Improvement Plan Projects

Jurisdiction:	Town of Blue River
Action Title:	Complete Capital Improvement Plan projects for roads to improve drainage and avoid flooding risks and road damage. Good neighbor program.
Hazard(s) Mitigated:	Flood
Priority:	Medium
Background/Issue:	Many Town road lack proper drainage. During periods of heavy run-off or melting, properties are facing flooding into homes.
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	FEMA
Potential Funding:	HMA Grants,
Cost Estimate:	$2,000,000
Benefits: (Losses Avoided)	By completing projects within the Town of Blue River Capital Improvement Plan, proper drainage and culverts may be installed allowing for water to run off of roads, into ditches and proceed to wetlands. In cases of heavy rain, flooding or run-off this will help protect properties
Timeline:	2023
Status:	New in 2020

Mitigation Action: Blue River – 11 Winter Preparedness Kits

Jurisdiction:	Town of Blue River
Action Title:	Winter preparedness kits and information for mountain road traveling along Hwy 9 and Hoosier Pass
Hazard(s) Mitigated:	Severe Winter Weather
Priority:	Medium
Background/Issue:	Winter preparedness kits and information for mountain road traveling along Hwy 9 and Hoosier Pass. Being a major thorough fair for those traveling to and from Summit County, the Town experiences inclement weather and the possibility of stranded motorists.
Ideas for Implementation:	
Responsible Agency:	Town of Blue River Town Management
Partners:	
Potential Funding:	Staff Time
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	Being able to provide weather kits and expanding information about traveling through Blue River and being prepared, will help mitigate incidents.
Timeline:	2023
Status:	New in 2020

B.7 Implementation and Maintenance

Moving forward, the Town will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

B.7.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Town to help inform updates and the development of local plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

The risk and vulnerability information the 2013 Summit County Hazard Mitigation Plan and the Town of Blue River annex was used to inform the 2015 update to the Town of Blue River Comprehensive Plan, as noted in section B.4 Capability Assessment. Refer to subsection B.4.1 Regulatory Mitigation Capabilities for more information related to the integration and acknowledgment of the hazards in the Town's Comprehensive Plan.

Process Moving Forward

Moving forward, the Town may utilize the hazard information when reviewing a site plan or other type of development applications. The Town will also incorporate this HMP into future updates to the Town of Blue River's Comprehensive Plan as appropriate.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Blue River will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting

B.7.2 Monitoring, Evaluation and Updating the Plan

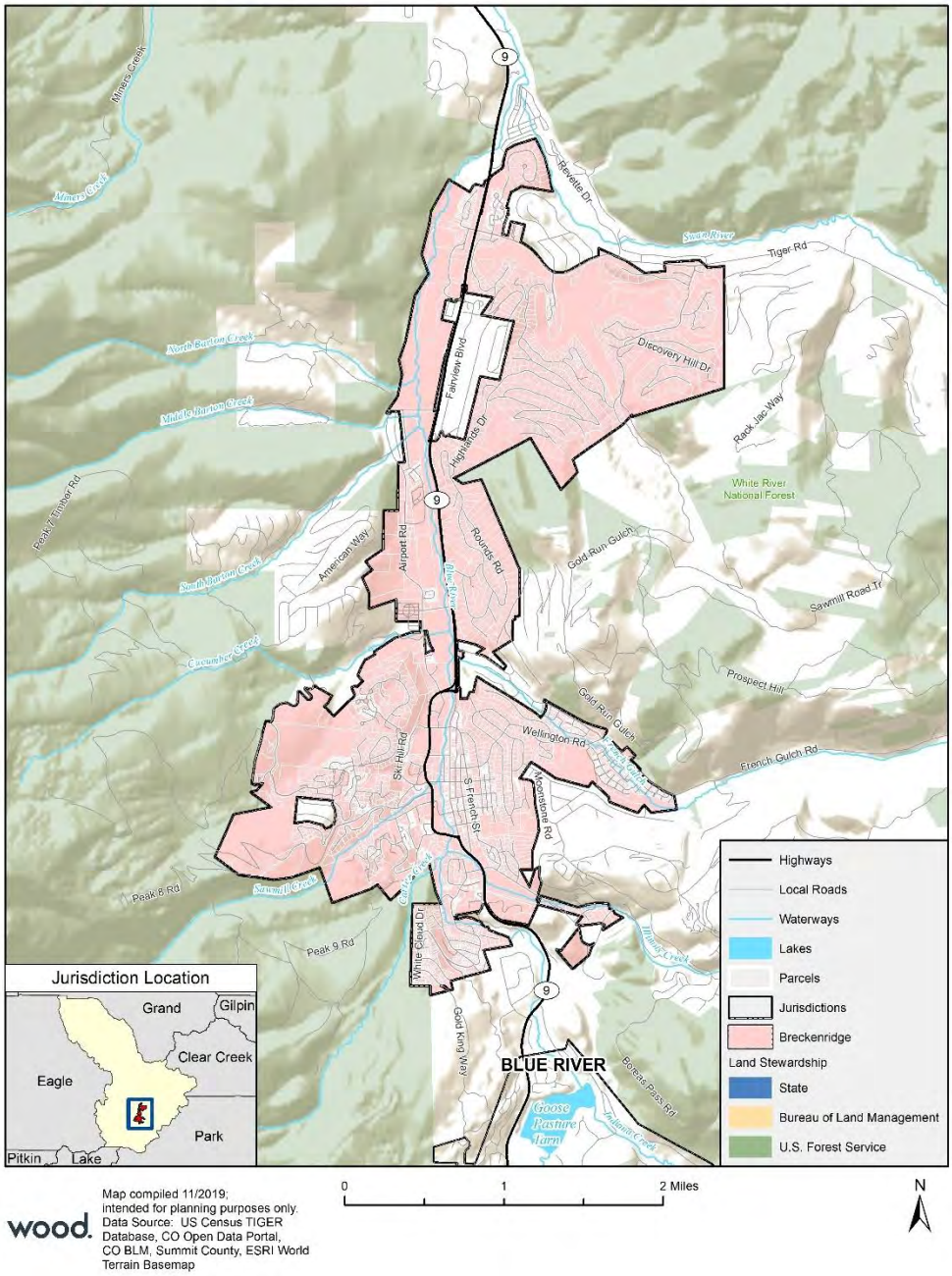
The Town will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The Town will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The Town Manager will be responsible for representing the Town in the County HMPC, and for coordination with Town staff and departments during plan updates. The Town realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

Annex C: Town of Breckenridge

C.1 Community Profile

Figure C-1 shows a map of the Town of Breckenridge and its location within Summit County.

Figure C-1 Map of Breckenridge



C.1.1 Geography

The Town of Breckenridge encompasses approximately 3,700 acres of land, at an elevation of 9,600 feet. The Blue River flows northerly through Breckenridge along the valley floor. It has a steep narrow channel with a slope of approximately 108 feet per mile from the Goose Pasture Tarn to the Dillon Reservoir and an average width of about 30 feet. Breckenridge is surrounded by three mountain ranges: The Ten Mile Range to the west, Bald Mountain and the Front Range on the east, and Hoosier Pass and the Mosquito Range on the south. Annual precipitation exceeds 30 inches in the higher elevations and includes over 300 inches of annual snowfall.

C.1.2 Population

The population of Breckenridge fluctuates throughout the year because of the resort nature of the community. Thus, the population of Breckenridge has two important components: permanent and peak. The permanent population is the number of people who reside in the town on a year-round basis and was estimated at 5,135 in 2019 and at 4,560 in 2010. Peak population is the total number of people who are in the town at one time, including residents, second homeowners, overnight guests, and day visitors, along with an assumed 100 percent occupancy of all lodging units. Peak population in 2019 was estimated at 41,497. According to the Town's master plan, the months with the largest peak populations are December through March, with a summer spike in July.

Data collected through employer surveys indicated that there were about 3,700 winter seasonal employees and 2,400 summer seasonal employees in 2006. However, this segment of the population is not well-documented or understood.

Select U.S. Census American Community Survey (ACS) demographic and social characteristics for Breckenridge as well as information provided from the HMPC are shown in the following tables and figures.

Table C-1 Breckenridge Demographic and Social Characteristics 2012-2017

Breckenridge	2012	2017	% Change
Population	4,676	4,927	5.4%
Median Age	31.4	30.7	-2.2%
Total Housing Units	5,839	6,153	5.4%
Housing Occupancy Rate	28.1%	28.1%	0%
Median Home Value	$448,200	$667,450	49%
Unemployment	4.9%	1.9%	-61.2%
Mean Travel Time to Work (minutes)	13.2	12.7	-3.8%
Median Household Income	$56,194	$76,774	36.6%
Per Capita Income	$31,243	$31,999	2.4%
% Without Health Insurance	22.8%	26.1%	14.5%
% of Individuals Below Poverty Level	5.4%	10.5%	94.4%
# of Households	1,896	2,135	12.6%
Average Household Size	2.28	2.85	25.0%
% of Population Over 25 with High School Diploma	99.1%	97.9%	-1.2%
% of Population Over 25 with Bachelor's Degree or Higher	57.1%	48.3%	-15.4%
% with Disability	0.9%	6.3%	600.0%
% Speak English less than "Very Well"	2.8%	1.7%	-39.3%

Source: HMPC and U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table C-2 Demographic and Social Characteristics Compared to the County and State

Demographic & Social Characteristics (as of 2017)	Breckenridge	Summit County	Colorado
Median Age	30.7	39.2	36.5
Housing Occupancy Rate	20.1%	30.80%	89.80%
Median Home Value	$667,450	$547,700	$286,100
Unemployment	1.9%	2.60%	5.20%
Mean Travel Time to Work (minutes)	12.7	16.4	25.2
Median Household Income	$76,774	$73,538	$65,458
Per Capita Income	$31,999	$37,192	$38,845
% Without Health Insurance	26.1%	21.40%	9.40%
% of Individuals Below Poverty Level	10.5%	10.30%	11.50%
Average Household Size	2.85	3.1	2.55
% of Population Over 25 with High School Diploma	97.9%	93.40%	91.10%
% of Population Over 25 with bachelor's degree or Higher	48.3%	47.80%	39.40%
% with Disability	6.3%	6.10%	10.60%
% Speak English less than "Very Well"	1.7%	7.50%	6.00%

Source: HMPC and U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table C-3 Demographics by Race and Sex

Blue River	Population	%
Total Population	4,927	
Male	2,483	51.4%
Female	2,350	48.6%
White, not Hispanic	4,591	95.0%
Hispanic or Latino	149	3.1%
Black	86	1.8%
Asian	7	0.1%
American Indian and Alaska Native	0	0.0%
Native Hawaiian and Other Pacific Islander	0	0.0%
Some other race	46	1.0%
Two or more races	64	1.3%

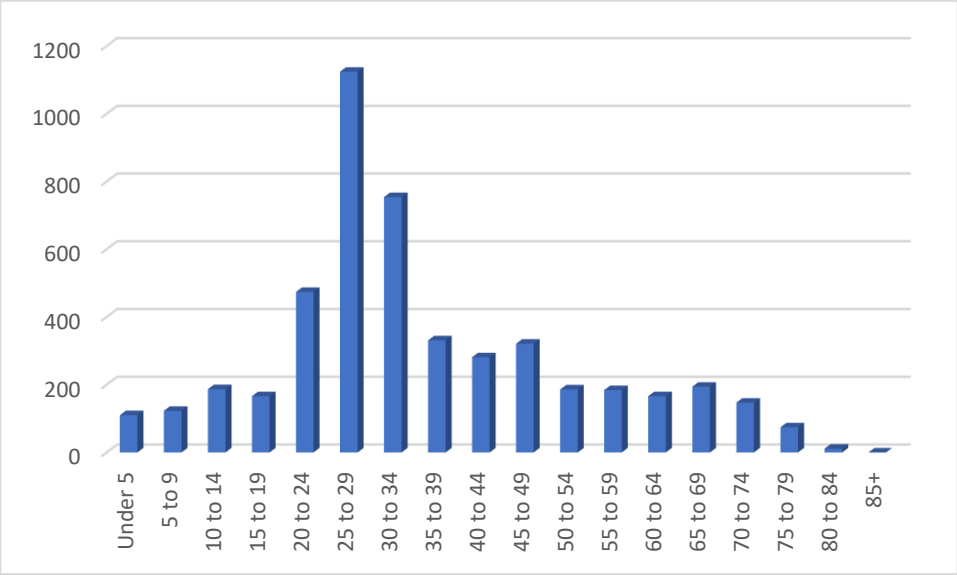
Source: HMPC and U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table C-4 Types and Total Amounts of Housing Units in Breckenridge

Type of housing units	Total	Percentage
Total housing units	7,082	
1-unit detached	1,528	21.6%
1-unit attached	749	10.6%
2 units	191	2.7%
3 or 4 units	359	5.1%
5 to 9 units	559	7.9%
10 to 19 units	964	13.6%
20 or more units	2,701	38.1%
Mobile home	31	0.4%
Boat, RV, van, etc.	0	0.0%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Figure C-2 Age Distribution in Breckenridge



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

C.1.3 History

Long before white settlers from the east crossed the Continental Divide, Breckenridge was part of the summer hunting grounds of the nomadic White River and Middle Park Ute Native Americans. The Town of Breckenridge was born out of the mid-nineteenth century gold rush and formally created in November 1859.

In the fall of 1861, the Town secured the Denver, Bradford, and Blue River Road Wagon Company connection, which gave lifeblood to the little gold mining community. Breckenridge was established as the permanent county seat of Summit County. However, by the mid-1860s there was a drop in the Breckenridge population due to both the Civil War and the increasing difficulty in locating free, accessible gold. Many businessmen and merchants moved on to other boomtowns.

The late-1860s saw the introduction of large-scale hydraulic placer mining and Breckenridge was once again busy with mining endeavors. By 1879, Breckenridge was an important hard-rock mining location and prominent supply center. The discovery of rich silver deposits and lead carbonates in the hillsides nearby put the Breckenridge mining district on the map, and the community was formally incorporated in 1880.

Breckenridge remained a prosperous frontier mining town for many years, but by the turn of the century, the local mining technology had shifted primarily to dredge mining, which employed relatively few people. The population and economy continued to decline during the Great Depression. The last gold dredge shut down in 1942 as resources shifted to the war effort associated with World War II.

In 1961, the Breckenridge Ski Area opened and breathed new life into the Town, drawing new visitors to discover and settle in Breckenridge. To this day, the "recreation" rush to Breckenridge continues.

C.1.4 Economy

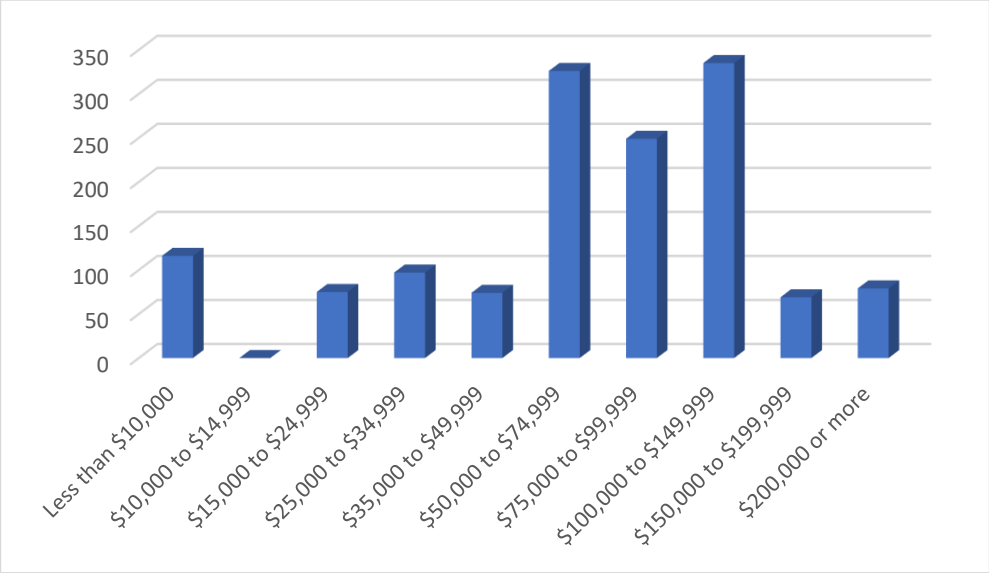
Mining activity was the primary economic force from the time Breckenridge was founded in 1859 until the early 1940s. The 1960s marked the beginning of a new era for Breckenridge, as recreation became the principal economic and population generator. Specifically, in 1961 the Breckenridge Ski Area was established, creating an enormous increase in the job market. The completion of I-70, the Eisenhower Tunnel, and Dillon Reservoir further enhanced the area's attractiveness and continued the drive towards a tourism-based economy.

In addition to the tourism economy, the second-home building market has been a major contributor to the local economy. The second-home building market not only creates numerous jobs in construction, but also creates the need for a number of jobs that support the construction industry (e.g., material supplies, landscaping services, realtors) and the additional need for retail and service businesses to accommodate the construction workers. In turn, this creates the demand for more construction to provide housing for the workforce. The second home and investment property market in Summit County has become an economic driver approaching the level of tourism and may soon overtake winter tourism in economic importance.

According to 2017 Census Bureau estimates, the industries that employed the highest percentage of Breckenridge's labor force were arts, entertainment, recreation, accommodation, and food services (53.2%); retail trade (9.3%); professional, scientific, and management, and administrative and waste management services (7.7%); educational services, and health care and social assistance (7.6%); and finance, insurance, real estate, and rental and leasing (7.1%).

As shown in Table C-2 per capita income in Breckenridge was $31,999 in 2017, which is roughly 15% below average for both Summit County and the State of Colorado. A breakdown of Breckenridge's income distribution is shown in Figure C-3.

Figure C-3 Income Distribution in Breckenridge



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

C.2 Hazard Identification and Profiles

Breckenridge's HMPC identified the hazards that affect the community and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and overall significance specific to the Town (see Table C-5). In the context of the countywide planning area, there are no hazards that are unique to Breckenridge.

Table C-5 Breckenridge Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Unlikely	Limited	Low
Dam Failure	Large	Unlikely	Catastrophic	Medium
Drought	Large	Occasional	Limited	Medium
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Flood	Small	Likely	Critical	High
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Critical	Low
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Occasional	Limited	Medium
Lightning	Large	Likely	Critical	Medium
Pest Infestation (Forest and Aquatic)	Medium	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Likely	Catastrophic	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles HIRA document (main plan).

C.3 Vulnerability Assessment

The intent of this section is to assess Breckenridge's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan.

C.3.1 Community Asset Inventory

Table C-6 shows the total number of improved parcels, properties, and their improvement and content values for the Town of Breckenridge. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were

estimated as a percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, 100% for Commercial structures, and 0% for Exempt and Vacant parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table C-6 Breckenridge Improved Parcel and Property Exposure

Parcel Type	Parcel Totals	Total Properties*	Improved Value	Content Value	Total Value
Commercial	119	509	$225,259,506	$225,259,506	$450,519,012
Exempt	411	586	$0	--	$0
Residential	3,058	7,791	$5,878,017,954	$2,939,008,977	$8,817,026,931
Vacant	4	27	$196,314,548	--	$196,314,548
TOTAL	3,592	8,913	$6,299,592,008	$3,164,268,483	$9,463,860,491

Source: Summit County Assessors Data, November 2019.

*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table C-7 lists summary information about the 30 critical facilities and other community assets identified by Breckenridge's HMPC as important to protect or provide critical services in the event of a disaster. Table C-8 details more information on the critical facilities in question found in Breckenridge. Note that there were several critical facilities the HMPC indicated should not be disclosed in terms of location or name, so while they were considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, they will not be described in detail nor will they be shown in any maps. As such, the detailed facility list only contains information for 29 of the 30 facilities. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the Base Plan.

Table C-7 Breckenridge Critical Facilities and Infrastructure Summary

FEMA Lifeline	Critical Facility Type	Total
Energy	Energy Substations	1
Food/Water/Shelter	Water/Wastewater Facilities	1
Hazardous Materials	HazMat Tier II SARA Facilities	1
Health and Medical	Ambulance Stations	1
	Medical Facilities	1
Other/Schools	Schools	4
Safety and Security	Fire Lookout Locations	3
	Fire Station	3
	Government Buildings	11
	Incident Facilities*	1
	Police Stations	2
Transportation	Helipads	1
TOTAL		30

* This facility's location will not be disclosed, and no additional details will be provided.

Source: Town of Breckenridge, Summit County, and HIFLD.

Table C-8 Detailed List of Critical Facilities and Infrastructure in Breckenridge that Can Be Disclosed

FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location / Values/ Notes
Energy	Energy Substations		Wellington Rd (Town of Breckenridge) – Xcel Energy
Food/Water/ Shelter	Wastewater Facilities	Upper Blue Waste Water Treatment - Breck	$5.8 M
Food/Water/ Shelter	Water Facilities	Water Storage Facilities including Goose Pasture Tarn	$9.59 Million
Food/Water/ Shelter	Static Water Structure	Breckenridge North Water Treatment Plant	68 Stan Miller Drive, Breckenridge, 80424
Food/Water/ Shelter	Wastewater Facilities	Breckenridge Treatment Plant (aka Gary Roberts Water Treatment Plant)*	99 Trapper Pl # 97, Blue River 80424
Hazardous Materials	HazMat Tier II SARA Facilities	CenturyLink Communications - Breck Central Office	300 W Four O'Clock Rd, Breckenridge 80424
Health and Medical	Ambulance Stations	SCG Ambulance	
	Medical Facilities	Breckenridge Mountain Clinic	
Other/Schools	Schools	Breckenridge Elementary School	
		Upper Blue Elementary School	
		Colorado Mountain College - Breckenridge	
Safety and Security	Fire Lookout Locations		
			Ski Hill Rd, East
	Fire Station	RWB Station 6	316 N. Main St, Breckenridge 80424
		RWB Station 4	13549 HWY 9, Breckenridge 80424
		RWB Station 5	1999 Ski Hill RD, Breckenridge 80424

FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location / Values/ Notes
	Government Buildings	Breckenridge Police Department	
		USPS Breckenridge	
		Summit County Sheriffs Storage	
		County South Branch Library	
		Breckenridge Public Works	
		Summit County Road & Bridge Storage	
		Breckenridge Recreation Center	
		Summit County Justice Center & Sheriff	
		Breckenridge Town Hall	$3 Million replacement value
		Old County Courthouse	
		Breckenridge Building	
	Police Stations	Breckenridge Police Department	150 Valley Brook St, Breckenridge 80424;$ 4.5 Million (Facility), and $150,000 (Equipment)
		Summit County Sheriff's Office	501 N Park Ave, Breckenridge 80424
Transportation	Helipads	Rankin Ave - TOB Helipad and transit centers	

* Note: This facility is located in the Town of Blue River but is owned by the Town of Breckenridge. Refer to Annex B Town of Blue River for analysis specific to this facility. Source: Summit County GIS, Summit County HMPC.

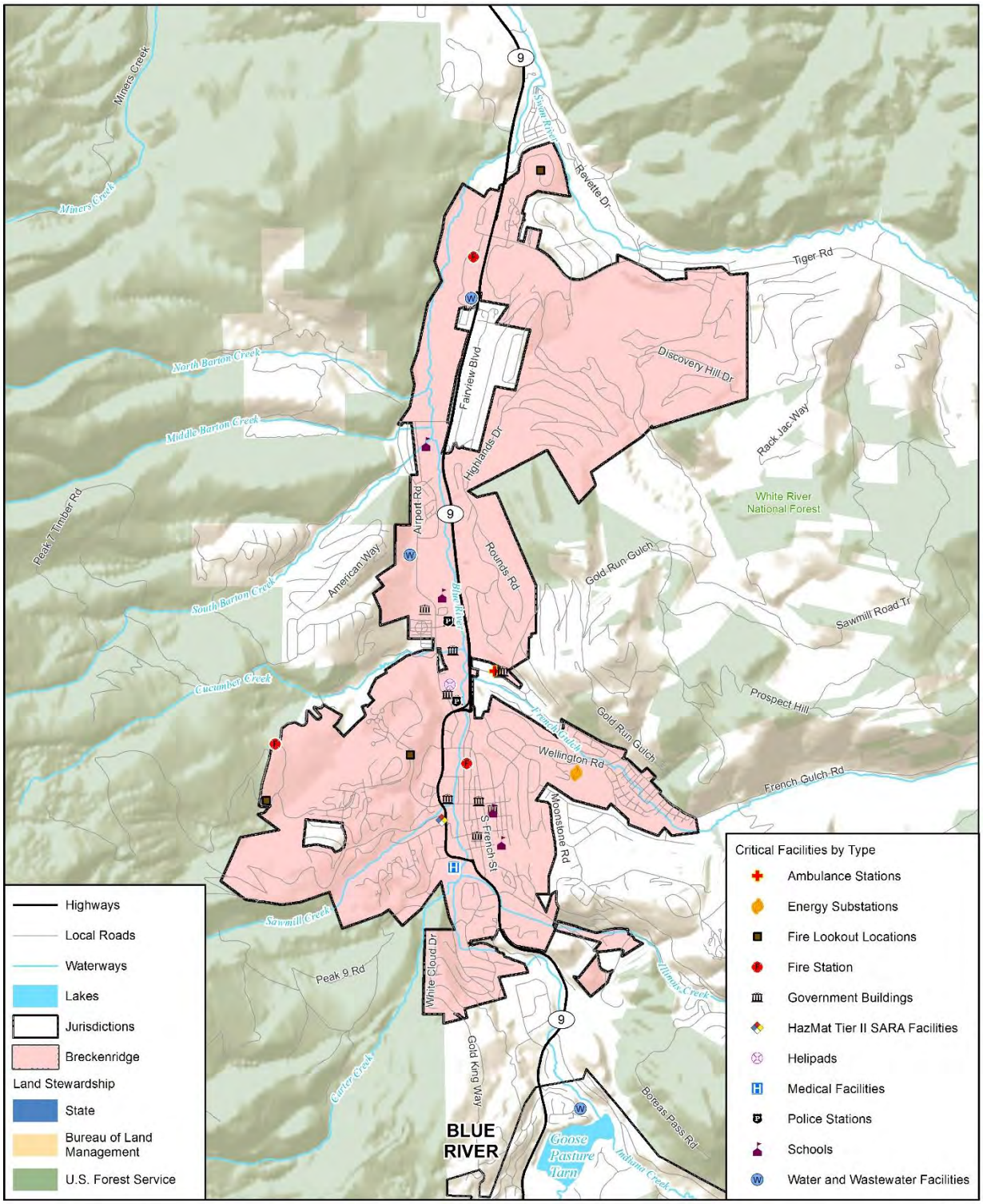
Other assets noted by the Town include:

- Carriage House: $1.4 Million – 104 people occupancy
- Little Red Schoolhouse: $1.56 Million – 102 people occupancy
- Timberline Learning Center: $3.9 Million
- Transit Centers: $950,000
- Boreas Railroad Station Site: $147,000
- Breckenridge Historic District: $660,000

A major concern of the Town's planning team is the necessary evacuation of the Town residents on Highway 9 (northbound and southbound) in the event of a disaster or significant emergency. There are two areas that seriously impact the possible speed of any evacuation. One is the development at the base areas of Peaks 7 and 8, which would have to enter into the Town limits before being able to leave the area. The locations of critical facilities in Breckenridge identified by Summit County are illustrated in Figure C-4 .

The Town also needs to further evaluate the seasonal workforce, which is greater than the Town's permanent population, to better understand their impact on the community and what needs to be done to protect them.

Figure C-4 Breckenridge's Critical Facilities and Infrastructure



Map compiled 2/2020;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, HIFLD

C.3.2 Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan.

- Avalanche
- Drought
- Earthquake
- Erosion/Deposition
- Hazardous Materials Release (Transportation)
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Only Dam Inundation, Flood, Landslide/Mudflow/Debris Flow/Rockfall, and Wildfire hazards will be profiled in the following vulnerability assessment sections, due to the ability to quantify vulnerability further with available data.

Dam Failure

General Property

The Goose Pasture Tarn Dam is a High hazard structure located upstream of Breckenridge and has a maximum storage capacity of approximately 811acre-feet. The Sawmill Reservoir Dam is found within the boundaries of the Town, on its south-southwest area. This Significant hazard dam only has an estimated maximum storage of 36 acre-feet, however. Finally, the Upper Blue Lake Dam is also a High hazard dam, but this one has a slightly higher maximum storage capacity of 2,100 acre-feet. It is located near the Summit County and Lake County boundary, about 5 miles east of the Robinson Tailings Pond.

While there is no concrete data available to indicate any likelihood of failure, based on best available dam inundation data there might be structures potentially at risk of dam failure flooding. The dam failure inundation maps contain sensitive information and are not available for display in this public planning document. Based on a GIS analysis performed with the county parcel layer and the available dam inundation mapping (for planning purposes only), the following potential damages would be expected in Breckenridge. Note that additional details on the GIS analysis methodology, data preparation process, and other helpful information for understanding how vulnerability assessment results were obtained can be found in Section 3.3. Vulnerability Assessment within the Base Plan.

Table C-9 Estimated Dam Inundation Exposure to Properties in Breckenridge

Parcel Type	Total Properties Exposed	Improved Value	Content Value	Total Value	Population Exposed
Commercial	362	$150,569,896	$150,569,896	$301,139,792	--
Exempt	33	$0	--	$0	--
Residential	1,624	$1,094,060,941	$547,030,471	$1,641,091,412	5,034
Vacant	3	$2,906,116	--	$2,906,116	--
TOTAL	2,022	$1,247,536,953	$697,600,367	$1,945,137,320	5,034

Source: Summit County GIS and Assessor's Office, U.S Census, Wood Analysis

People

Based on the GIS analysis summarized in the table above, it is expected that around 5,034 people in Breckenridge might be at risk of dam inundation hazards. These totals were estimated by multiplying the average number of persons per household in Summit County (which equals 3.10) times the number of residential properties where dam inundation extents were available.

Critical Facilities and Infrastructure

Based on the critical facility inventory considered in the updating of this plan and intersected with the dam inundation extents available for the Town of Breckenridge, 15 critical facilities were found to be at potential risk. These are summarized in the table below.

Table C-10 Critical Facilities in Breckenridge Exposed to Dam Inundation

FEMA Lifeline Category	Critical Facility Type	Total Critical Facilities
Health and Medical	Medical Facilities	1
Other/Schools	Schools	2
Safety and Security	Fire Station	2
	Government Buildings	6
	Incident Facilities	1
	Police Stations	2
Transportation	Helipads	1
TOTAL		15

Source: Summit County, HIFLD, Wood Analysis

Economy

In addition to commercial and residential building impacts, a dam inundation event that affected the major roads which give access to the town (e.g. Highway 9) could significantly affect the local economy, by limiting or completely impeding access to shops, restaurants, hotels, and other major industries which keep the local economy thriving.

Historical, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. For the most part the environment is resilient and would be able to rebound, though this

process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would.

Future Development

There are probably limited impacts to future development since the inundation zone is already developed below the Goose Pasture Tarn Dam. For the Sawmill Dam, the inundation zone of the Snowflake and Westridge subdivisions below the dam was excluded from development during the platting phases about 10 to 15 years ago. Below those subdivisions development had already occurred before the inundation mapping was updated in 2006.

Flood

The major drainageway through Breckenridge is the Blue River, which flows through the center of Town. The streambed is straight and rough containing large rocks. The floodplain is largely confined to the channel, but does increase to between 300 to 400 feet in width in the ponds and behind some of the culverts. Most of the floodplain in Breckenridge contains no vegetation but is covered in rocks. The downstream reaches have willow bushes and gravel tailings covering much of the floodplain. Tributaries flowing into the Blue River are steep and shallow (FEMA, 2001).

Flooding in Breckenridge is primarily caused by the overflow of the Blue River, and smaller tributaries such as Illinois Creek, Indiana Creek, Carter Creek, Sawmill Creek, French Gulch, Cucumber Creek, South Barton Creek, Middle Barton Creek, and North Barton Creek (see Figure C-5). Flooding is mostly likely to occur in mid-June due to runoff from snowmelt. Major past flooding within the town was caused by backwater from blocked culverts and bridges. Many of the culverts have since been replaced; however, if these become blocked, they would again cause flooding around major crossings.

The Goose Pasture Tarn, a small reservoir immediately upstream of Breckenridge, also serves as a flood protection measure for the Blue River. The tarn has a drainage area of approximately 43.5 square miles, a storage capacity of nearly 811-acre-feet, and a spillway design capacity of 2,055 cubic feet per second. With the completion of the Goose Tarn Dam Repair project the capacity will be updated to 18,500 cubic feet per second (Town of Breckenridge HMPC, 2020). The reservoir is important in reducing the peak discharge of the Blue River due to rainfall. The reduction, however, is only marginal for runoff due to snowmelt, which is normally the major cause of peak flows. Other reservoirs in the Blue River basin above Breckenridge provide only incidental flood protection (FEMA, 2011).

General Property

Vulnerability to flooding was determined by summing potential losses to Summit County's properties in GIS, by using the latest FEMA NFHL data along with the Summit County parcel layer provided by the Assessor's Office. FEMA's NFHL data depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events. Figure C-5 below displays Breckenridge's FEMA special flood hazard areas present in the town, color coded based on flood event (i.e. 100-year versus 500-year).

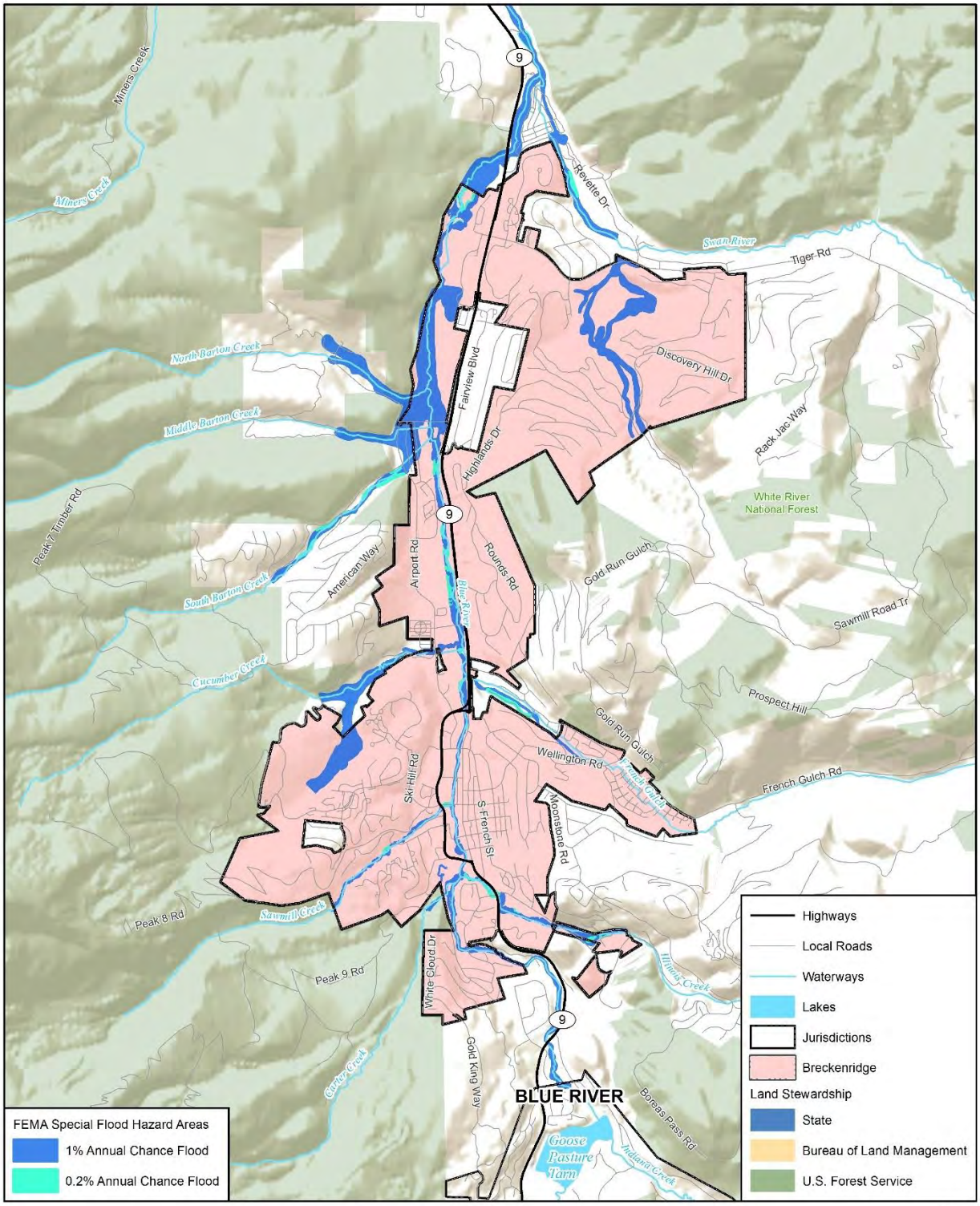
Based on the GIS analysis performed with the county parcel layer and the available FEMA flood mapping, the potential risk for the Town is shown in Table C-11. Breckenridge's 1% annual chance flood zone presents has 32 properties and an estimated $45 million total value exposed. The 0.2% annual chance event would add an additional 5 properties, with loss estimates for both flood events equaling about $12.9 million in Breckenridge. Most properties at risk of flooding from both events are residential.

Table C-11 Summary of Breckenridge Properties Vulnerable to 1% and 0.2% Annual Chance Flood Events, by Property Type

Flood Event	Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population
100-year	Exempt	4	$0	--	$0	$0	--
	Residential	28	$30,019,320	$15,009,660	$45,028,980	$11,257,245	87
TOTAL		**32**	**$30,019,320**	**$15,009,660**	**$45,028,980**	**$11,257,245**	**87**
500-year	Residential	5	$4,314,256	$2,157,128	$6,471,384	$1,617,846	16
TOTAL		**5**	**$4,314,256**	**$2,157,128**	**$6,471,384**	**$1,617,846**	**16**
GRAND TOTAL		**37**	**$34,333,576**	**$17,166,788**	**$51,500,364**	**$12,875,091**	**102**

Source: Summit County, FEMA NFHL, U.S. Census Bureau, Wood analysis

Figure C-5 FEMA Special Flood Hazard Areas in Breckenridge



Map compiled 11/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, FEMA NFHL

Flood Insurance Program Policy Analysis

Breckenridge joined the National Flood Insurance Program (NFIP) on June 4, 1980. NFIP insurance data indicates that as of September 12, 2019, there were 54 flood insurance policies in force in the County with $14,357,000 of coverage. This is an increase of 8 policies since 2013. Twenty-eight of the policies are currently in A01-30 and AE zones, and 26 were located outside of the Special Flood Hazard Area (i.e. in B, C, & Z zones).

There has been one historical claim for flood losses totaling $28,060. There are no repetitive or severe repetitive loss structures as defined by the NFIP as of 2019.

People

The population exposed to the flood hazards described in the flood vulnerability analysis above was estimated by applying an average household size factor (based on 2018 U.S Census estimates for Summit County of 3.1 persons per household) to the number of improved residential properties identified in the flood hazard areas within Breckenridge. These estimates yielded the population exposures shown in the table above (Table C-11). As such, the combined 1% and 0.2% annual chance floods would potentially displace 102 people, based on the residential structures which fall in those flood zones. For additional details on potential displacements by flood event, see the Summit County Base Plan.

Critical Facilities and Infrastructure

No critical facilities were found to overlap with the flood zones mapped for Breckenridge. This does not necessarily mean that no critical facilities are at risk of flooding, as localized flash flooding or non-mapped flooding is still possible outside of the studied stream areas.

Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, and other downtime costs. Flooding often coincides with the busy summer tourism months in Summit County, and may impact, directly or indirectly (such as from the negative perception of potential danger to his hazard), the revenues of shops, restaurants, hotels, and other major industries which keep the local economy thriving. In addition, major flooding which led to road or other infrastructure closures could additionally limit access to the Town by tourists, locals, and even basic goods and services.

Historical, Cultural, and Natural Resources

The environment is mostly resilient to general flooding. However, cultural or historic properties within floodplains would be affected in similar ways as property and critical facilities/infrastructure, especially those with underground or basement levels where water would easily seep and potential ruin archives, resources, or other important assets.

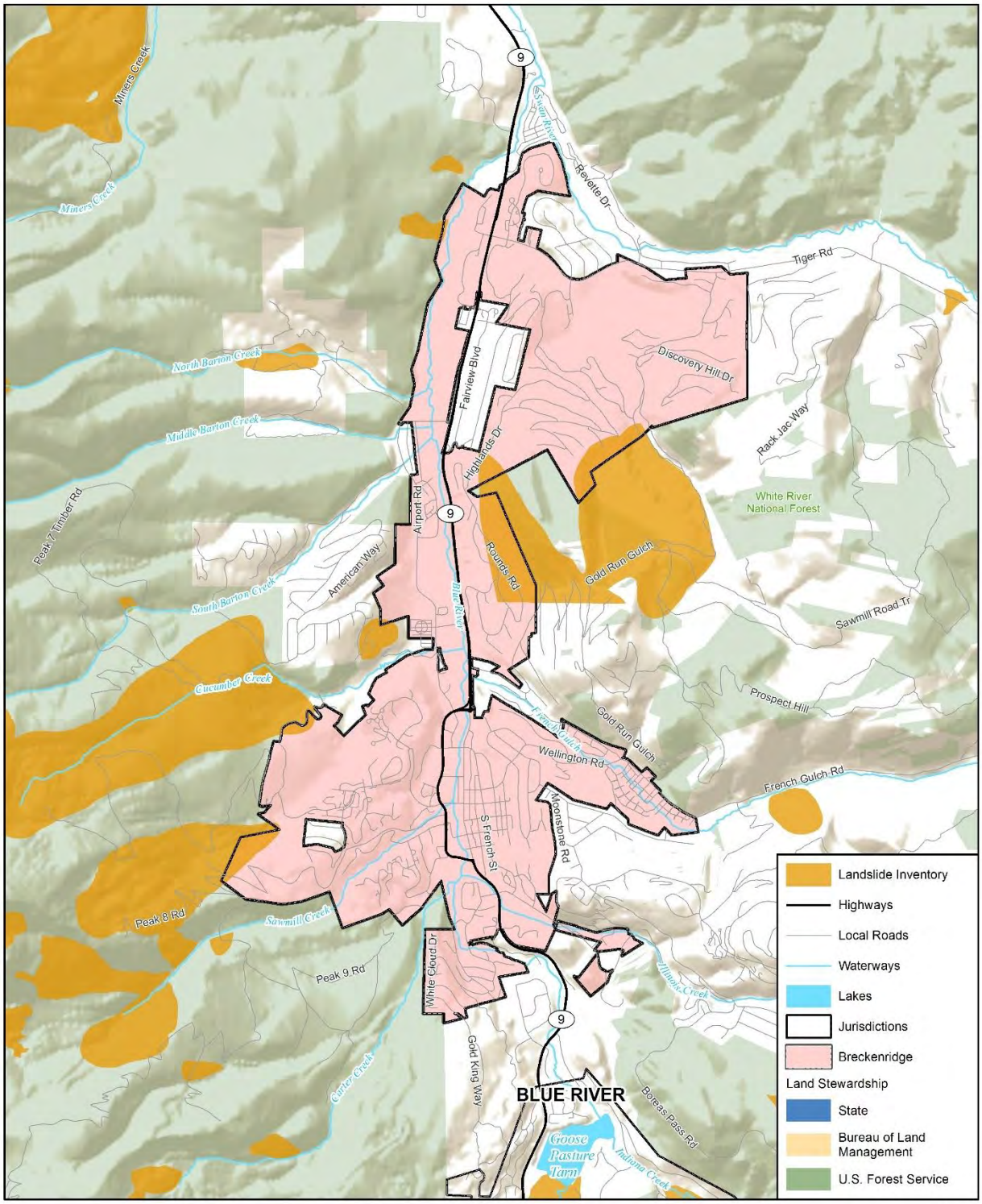
Future Development

The Breckenridge Flood Damage Prevention Ordinance meets minimum NFIP requirements and regulates development in special flood hazard areas. In addition, the Town addresses floodplain management policies in its Master Plan and Development Code (see Regulatory Capabilities section below).

Landslide, Mud Flow/Debris Flow, Rock Fall

Possible landslide areas are identified on steep slopes with unstable soil conditions. Areas identified in the Breckenridge area for possible landslides are in the Sawmill and Lehman gulches, Shock Hill, Ford Hill, Little Mountain, Silver Shekel, and Warriors Mark West (Breckenridge Comprehensive Plan, 2008). General landslide hazard areas are displayed in Figure C-6 below.

Figure C-6 Landslide Hazard Areas in Breckenridge



Map compiled 11/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CGS

General Property

Potential losses for general landslide areas were estimated using Summit County GIS and assessor's parcel data. Based on the GIS analysis performed, the potential risk to general landslide areas in Breckenridge is summarized in Table C-12. For the purposes of this analysis, if a parcel's centroid intersected the landslide hazard polygons, that parcel is assumed to be at risk. Content values were calculated from the improvements as a percentage of property improvement values based on their occupancy type (using FEMA Hazus guidance), so that Residential properties received content values worth 50% of their improvements. Property improvements and content values were then totaled to arrive at the Total Value column. Note that additional details on the GIS analysis methodology, data preparation process, and other information can be found in Section 3.3. Vulnerability Assessment within the Base Plan.

Breckenridge's Residential properties have a total exposure value of over $109.5 million. A total of 44 properties are exposed to general landslide hazards. A site-specific analysis would be needed to further quantify actual risk to structures on these parcels.

Table C-12 Property Exposure to General Landslide Hazard Areas in Breckenridge

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Residential	44	$73,013,286	$36,506,643	$109,519,929	136

Source: Summit County GIS/Assessor Office, Colorado Geological Survey, U.S. Census, Wood analysis

People

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways. Based on Table C-12 above, an estimated 136 people could be at risk of general landslide hazards in Breckenridge. At risk population was estimated by multiplying the average number of persons living in each household in Summit County (which is 3.1 per household) times the number of properties of type "residential" where landslide areas have been inventoried in the town.

Critical Facilities and Infrastructure

No critical facilities are found at risk of landslide hazards in Breckenridge.

Economy

Economic impacts related to landslide, rockfall, debris fall, and mudslide hazards typically center around transportation routes temporarily closed by debris flow or other activity. No routes were found to be at risk.

Historical, Cultural, and Natural Resources

As primarily natural processes, landslides and debris flows can have varying impacts to the natural environment as well as cultural or historical resources found on their path. For buildings and other structures, impacts would be similar as those seen on general property or critical facilities/infrastructure.

Future Development

The Town's Comprehensive Plan (2008) addresses requirements for development in areas with steep slopes. An engineer's report is required prior to construction for development on slopes of 15% or greater. The Town discourages development on slopes of 15% or greater, and encourages the density allocated to these sites to be transferred to areas suitable for development.

Wildfire

General Property

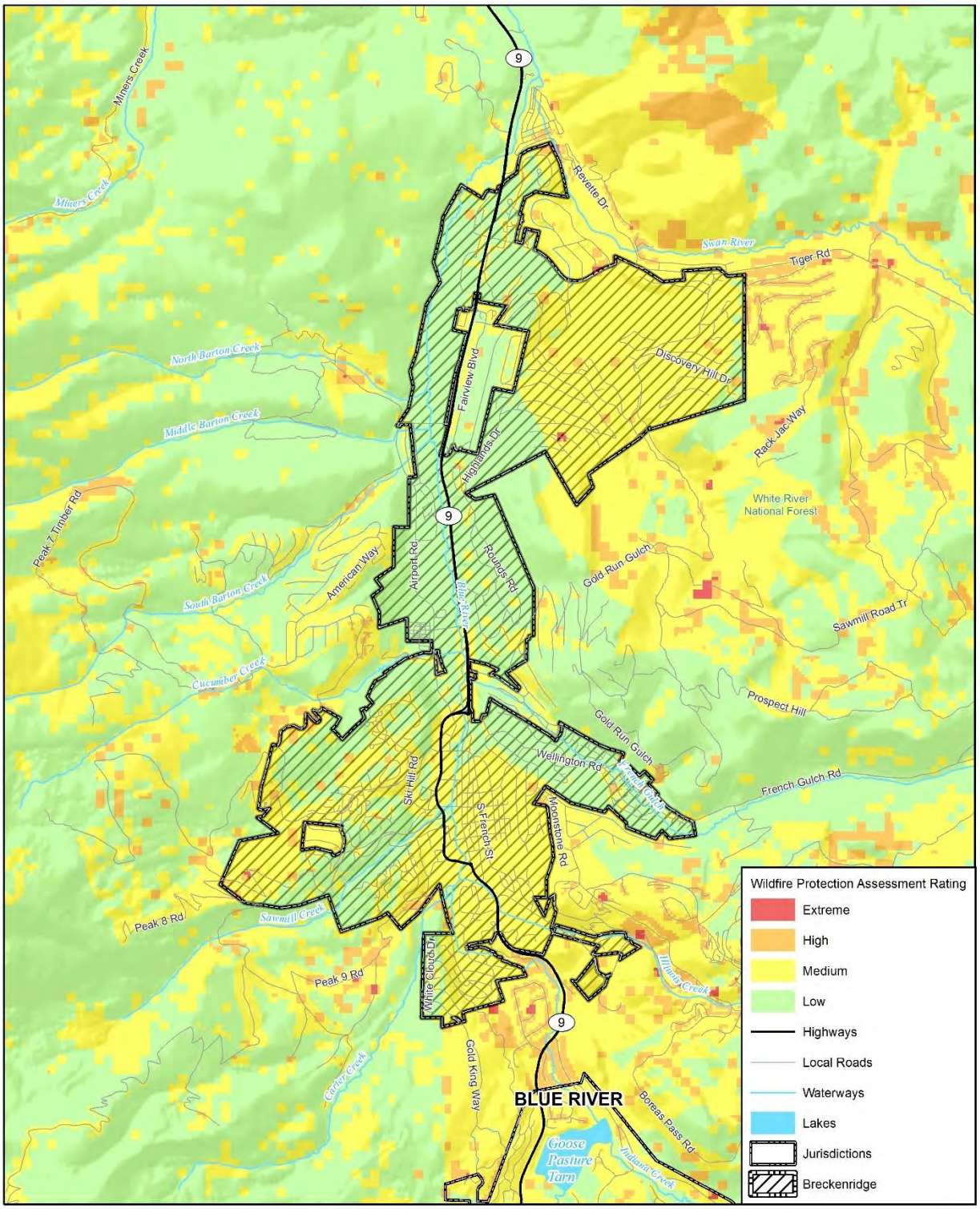
Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which classifies areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in Breckenridge. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. Property improvements and estimated content values were then totaled to arrive at the Total Value column, which is also the estimated potential loss as wildfires typically result in complete loss to structure and contents. Breckenridge was found to intersect with wildfire areas rated as Medium, High, and Extreme, summarized by property type in Table C-13 below. Wildfire protection assessment areas for Breckenridge are displayed in Figure C-7.

Table C-13 Property Values in Wildfire Zones* by Parcel Type, Breckenridge

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Commercial	371	$177,587,983	$177,587,983	$355,175,966	--
Exempt	27	$0	--	$0	--
Residential	5,623	$3,929,145,572	$1,964,572,786	$5,893,718,358	17,431
Vacant	5	$3,075,208	--	$3,075,208	--
TOTAL	6,026	$4,109,808,763	$2,142,160,769	$6,251,969,532	17,431

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis
*Medium, High or Extreme

Figure C-7 Wildfire Protection Assessment Areas and Ratings in Breckenridge



Map compiled 11/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CO-WRAP

People

The last column of Table C-13 above summarizes the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted, Breckenridge has an estimated 17,431 people at risk of Medium, High, and Extreme rated wildfire zones. These totals were estimated by multiplying the average persons per household in Summit County by the number of residential properties falling within the fire zone/s.

Smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

A total of 14 critical facilities were identified in Medium wildfire zones in Breckenridge (see Table C-14).

Table C-14 Critical Facilities in Breckenridge in Wildfire Protection Assessment Areas

FEMA Lifeline Category	Critical Facility Type	Total Critical Facilities
Health and Medical	Medical Facilities	1
Other/Schools	Schools	2
Safety and Security	Fire Lookout Locations	2
	Fire Station	2
	Government Buildings	5
	Police Stations	1
Transportation	Helipads	1
TOTAL		**14**

Source: Summit County, HIFLD, Wood Analysis

The Red, White, and Blue Fire Protection District, which provides fire protection services to Breckenridge, Blue River, and the surrounding area, is considered an initial attack center for wildland fires on all private land and takes a joint responsibility with the U.S. Forest Service for fires on federal land.

Economy

Tourism, the accommodation and food services industry (e.g. hotels and restaurants), and retail are major components of Summit County's economy, and Breckenridge's as well. Wildland fires can, for example, lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation, stays in hotels, spending on restaurants and other commerce sources, and more.

Historical, Cultural, and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after a fire.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important historical assets in Breckenridge.

Future Development

The Breckenridge Development Code requires that a wildfire plan is prepared and implemented for all areas designated with a "severe" wildfire rating and for all vegetated areas designated with a "hazard intensified due to slope" rating on the map of wildfire hazard and for all vegetated areas in excess of 30 percent slope. These plans must address wildfire prevention, mitigation, and control and shall further incorporate the recommendations contained within *Wildfire Hazards: Guidelines for Their Prevention in Subdivisions and Developments* prepared by the Colorado State Forest Service. The Town requires fuels mitigation for all properties seeking a development permit. Property owners with active development permits are now required to reduce fuels by removing most trees within a 30-foot defensible space zone of the home, limbing dead branches up to 10 feet off the ground, and removing woody litter off the forest floor.

C.3.3 Growth and Development Trends

Table C-15 illustrates how Breckenridge has grown in terms of population and number of housing units between 2012 and 2017.

Table C-15 Breckenridge—Change in Population and Housing Units, 2012-2017

2012 Population	2017 Population Estimate	Estimated Percent Change 2012-2017	2012 # of Housing Units	2017 Estimated # of Housing Units	Estimated Percent Change 2012-2017
4,676	4,927	+5.4%	5,839	6,153	+5.4%

Source: HMPC and U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

This growth rate is significantly slower than during the 2000-2011 time period, which saw 50% increases in both categories, partly due to the annexation of the Warrior's Mark area in 2002.

There is new development planned on the recently annexed Stan Miller property (155 units). At the base of Peaks 7 and 8 (mostly condominium and hotel units, 450-500 units, depending on size, most units will be short-term rentals and time shares), some more units recently completed at Wellington Neighborhood/Lincoln Park about 45 units at Valley Brook (north of police and Timberline Learning Center), 250-300 units planned for Block 11 and at Pinewood Village Phase 2 (45 units).

As of 2018, the Town of Breckenridge residential build-out was 88% of realistic build-out and it is estimated to experience build-out of remaining properties before the year 2030. Most future development that will take place in Breckenridge will be a mixture of multi-family, single family residential and mixed-use development occurring along Main Street. Future development on Main Street will likely focus on infill and adaptive reuse development. It is expected that land use tools, such as the Transfer of Development Rights (TDR) program in partnership with the county will continue and will evolve to include new markets for TDRs in the Town including affordable housing projects.

C.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

C.4.1 Regulatory Mitigation Capabilities

Table C-16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Breckenridge.

Table C-16 Breckenridge—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	Town of Breckenridge Comprehensive Plan (March 25, 2008)
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	Town of Breckenridge Subdivision Standards (February 14, 2020)
Growth Management Ordinance	Yes	Upper Blue Master Plan, updated 2011/Nonbinding agreement with Summit County government
Floodplain Ordinance	Yes	
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	Yes	Preventive Management Area Ordinance, Pine Beetle Ordinance
Building Code	Yes	Version: 2006 International Building Code
Fire Department ISO Rating	Yes	Rating: 4
Erosion or Sediment Control Program	Yes	
Stormwater Management Program	Yes	
Site Plan Review Requirements	Yes	Town of Breckenridge Development Code (February 12, 2019)
Capital Improvements Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Town of Breckenridge Emergency Operations Annex, revised 2012
Other Special Plans	Yes	Master Drainage Plan, 1993; Open Space, 2007
Flood Insurance Study or Other Engineering Study For Streams	Yes	FEMA Flood Insurance Study, November 16, 2018
Elevation certificates on file	Yes	
Other	Yes	Capacity Analysis for the Upper Blue Valley

Town of Breckenridge Comprehensive Plan, 2008

The Town Breckenridge Comprehensive Plan guides the future development of the town. The purpose of the Comprehensive Plan is to promote the health, safety, and welfare of the community and provide guidelines for the conservation and development of community resources. The Plan identifies goals and policies for the following primary sections: Natural Environment, Population and Demographics,

Transportation, Community Facilities, Economy, Housing, Recreation and Tourism, Cultural Resources, Historic Character, Community Character, and Land Use. It includes the following goals and policies related to hazard mitigation:

- **Goal:** Erosion/Landslide prevention and mitigation
  - **Policy:** Discourage development on slopes of 15 percent or greater or on land subject to natural hazards and require engineering when development on such sites is allowed.
  - **Policy:** Maintain undeveloped steep-slope areas exceeding 30 percent as natural open space to protect soils, vegetation, water, fish and wildlife, and open space resource value.
- **Goal:** Wildfire prevention and mitigation
  - **Policy:** Support hazardous and diseased tree removal and wildfire mitigation including the discouragement of wood shingles; but balance them with other goals such as landscaping, visual resources, buffers, etc.
- **Goal:** Flood loss prevention and mitigation
  - **Policy:** Maintain floodway areas in open and undeveloped land uses where legally permissible, including agriculture, parks, and open space.

Breckenridge Town Code

The Breckenridge Town Code serves as the legal framework for the Town and contains 12 titles and various subsections. Sections of the Town Code related to hazard mitigation are summarized below:

Title V. Public Health and Safety

The Public Health and Safety section of the Town Code includes several ordinances related to wildfire prevention and mitigation:

- Chapter 5: Except where otherwise allowed by this Code, it shall be unlawful for any person to conduct open burning anywhere in the town.
- Chapter 7: No person shall use or explode any fireworks, or supervise the use or explosion of any fireworks, other than permissible fireworks during times when the use or explosion of permissible fireworks is permitted pursuant to section 6-3C-11 of this code, in connection with, or as part of, a fireworks display unless a permit for such display has first been obtained from the town pursuant to this chapter.
- Chapter 11: …all trees infested with mountain pine beetle must be removed from the property by July 15 of the year in which the notice is given, or that an acceptable plan and schedule for removal of the beetle infested trees must be submitted to the director by such date.

Title IX. Land Use and Development

The Breckenridge Development Code includes the following policies and guidelines related to development in hazardous areas:

- Chapter 1: No development shall occur in any area of, or affected by, a geologic hazard unless mitigated to the satisfaction of the Town. Proof of mitigation may require reports as specified by the Town.

- Chapter 1: Erosion control measures shall be installed where required by the Town through the Breckenridge Water Quality and Sediment Transport Control Ordinance.
- Chapter 1: A wildfire plan shall be prepared and implemented for all areas designated with a "severe" wildfire rating and for all vegetated areas designated with a "hazard intensified due to slope" rating on the map of wildfire hazard and for all vegetated areas in excess of 30 percent slope. Such plans shall address wildfire prevention, mitigation, and control and shall further incorporate the recommendations contained within *Wildfire Hazards: Guidelines for Their Prevention in Subdivisions and Developments*, prepared by the Colorado State Forest Service.
- Chapter 1: No development shall increase danger to life or property from flood hazard within the Town. This shall include but not be limited to prohibition of actions which might increase the size of the floodway, reduce flood channel capacity, constrict the size or flow of the flood channel, create a significant backflow condition, increase the potential for debris in the floodway, or increase the volume or velocity of flood waters.
- Chapter 1: For all areas located within the special flood hazard areas as delineated on the Flood Boundary Floodway Map, the Flood Insurance Rate Maps, and the Flood Insurance Study, a plan of onsite flood prevention, control, and hazard mitigation shall be prepared and implemented according to the provisions of the Breckenridge Flood Damage Prevention Ordinance.
- Chapter 1: Improvements to the floodway or any part thereof which will result in an overall reduction of flooding potential or a reduction to the flood hazard area are encouraged.

Title X. Flood Control

This section includes ordinances for storm drainage, flood damage prevention, and water quality and sediment transport control standards:

- **Storm Drainage Ordinance**: Sets certain rules and standards for the control and drainage of storm and surface waters.
- **Flood Damage Prevention Ordinance**: The floodplain ordinance establishes the Town's special flood hazard areas (as identified by the flood insurance study and flood insurance rate map) and prohibits development, construction, or improvement within such floodplains in an effort to prevent flood damage and protect public health, safety, and general welfare.

Town of Breckenridge Emergency Operations Annex, revised 2012

The purpose of the Town of Breckenridge Emergency Operations Annex is to provide general guidelines and principles for planning, managing, and coordinating the overall response and recovery activities of the town departments; Red, White, and Blue Fire Protection District; participating agencies; and volunteer agencies to be used before, during, and after a threatened, imminent, or actual major emergency or disaster. The plan's guidelines are consistent with the accepted standards of the National Incident Management System as well as emergency planning guidelines developed by FEMA as adopted by the Town of Breckenridge.

Master Drainage Plan, 1993

The Master Drainage Plan's purpose was to identify existing deficiencies and provide recommendations for corrections. This document identified and analyzed the drainage basins affecting the Town of Breckenridge. To date, all of those deficiencies have been corrected except for the addition of drainage structures to Main Street. Improvements to Main Street were completed in 2014. According to the HMPC, the multi-year project included the addition of stormwater infrastructure.

Engineering Standards, 1987

Street, storm drainage, flood damage prevention, water quality and sediment transport control standards (Engineering Standards) were developed in 1987 to address the design and implementation of the Town's drainage systems. Any newly developed area is required to meet these standards and therefore provide a functioning drainage system. These standards deal with water quantity and quality.

Breckenridge Open Space Plan, 2007

The Breckenridge Open Space Plan provides the framework for how the open space sales tax revenues should be used. The plan addresses land acquisition, natural resource protection, land conservation values, stewardship and management of open space, and land protection strategies.

Breckenridge Open Space Advisory Commission

In 1997, the Town Council established the Breckenridge Open Space Advisory Commission (the BOSAC), which advises the Council on the appropriate goals and objectives of the Town's Open Space Program, such as the acquisition, stewardship, and preservation of open space. The BOSAC helps define the types of open space to be protected, the criteria used to select parcels for acquisition, and the priorities for stewardship practices. The BOSAC is also the public forum for discussion on open space issues.

Town of Breckenridge Mountain Pine Beetle Program Guidelines, 2008

The overall goal of the Town of Breckenridge Mountain Pine Beetle Program Guidelines is to contain the spread of the pine beetle infestation that plagues lodgepole pine forests. This program supports efforts to prevent or mitigate wildfires, due to the fact that trees killed by the pine beetle contribute to escalated wildfire risk.

The program is a joint effort between the Town and property owners. Free beetle inspections are provided by Town staff for property owners, and beetle-infested trees that are a declared nuisance are required to be removed. Permits issued by the Town are required for tree removal. Property owners are responsible for cutting down the trees and the Town chips them at curbside and hauls the remaining debris.

Floodplain Regulations and NFIP Participation

Breckenridge joined the National Flood Insurance Program (NFIP) on June 4, 1980. The floodplain management criteria and regulations for the town are contained in the Town Code under Ordinance No. 24 (Series 2018). Under this code, the Town Engineer is designated as the floodplain manager for Breckenridge, overseeing floodplain regulations. The Town of Breckenridge does not participate in the

Community Rating System (CRS). There are no repetitive loss or severe repetitive loss properties in Breckenridge as defined by the NFIP.

C.4.2 Administrative/Technical Mitigation Capabilities

Table C-17 identifies the personnel responsible for activities related to mitigation and loss prevention in Breckenridge.

Table C-17 Breckenridge—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with Knowledge of Land Development/Land Management Practices	Yes	Engineering and Community Development	
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	Yes	Engineering/Community Development	
Planner/Engineer/Scientist with an Understanding of Natural Hazards	No		
Personnel Skilled in GIS	Yes	Engineering	
Full Time Building Official	Yes	Community Development	
Floodplain Manager	Yes	Town Engineer	
Emergency Manager	No	Partner with Summit County government	
Grant Writer	No		
Warning Systems/Services (Reverse 9-11, Cable Override, Outdoor Warning Signals)	Yes	Summit County Communications	Reverse 911

C.4.3 Fiscal Mitigation Capabilities

Table C-18 identifies financial tools or resources that Breckenridge could potentially use to help fund mitigation activities.

Table C-18 Breckenridge—Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project Funding	Yes	
Authority to Levy Taxes for Specific Purposes	Yes	
Fees for Water, Sewer, Gas, or Electric Services	Yes	
Impact Fees for New Development	Yes	
Incur Debt through General Obligation Bonds	Yes	
Incur Debt through Special Tax Bonds	Yes	Town has done so in the past, but has not issued any in several years
Incur Debt through Private Activities	No	
Withhold Spending in Hazard Prone Areas	No	

In November of 1996, voters in Breckenridge passed a .5 cent sales tax to be used exclusively for open space and trails. The sales tax produced $1.64 million in 2006 and $3.1 million in 2018.

C.4.4 Mitigation Outreach and Partnerships

- The Town of Breckenridge uses the semiannual "Breckenridge Bulletin" to provide information to citizens in the Upper Blue Valley. It also uses local media (press releases), Town Council meetings, and pamphlets with information on wildfire, pine beetle, flooding, etc. that are available in town facilities and are free to the public.
- Each spring, the governments of Summit County, Breckenridge, Dillon, Frisco and Silverthorne distribute a packet of information to inform the communities about how to prepare for possible high water in May and/or June resulting from snowmelt.
- The Town participates in a transferable development rights (TDR) program with Summit County that protects Summit County's natural resources by allowing development rights to be voluntarily transferred from rural sending areas to urban receiving areas.

C.4.5 Past Mitigation Efforts

- The Town of Breckenridge constructed a flood bank project to keep the Blue River within its flood banks in the event of a significant flood.
- In the 1990s, the Town rerouted Sawmill Creek to remove structures from the floodplain.
- In 2005 and 2006, the Town's staff inspected all Town-owned properties, including public rights of way, for beetle-infested or dead trees. The Town then had trees removed that were beetle infested. The Town also sprayed trees on visually sensitive Town-owned land as a preventive measure against pine beetle infestation.
- Breckenridge has received a Section 206 grant from the U.S. Army Corps of Engineers for a stream restoration project along approximately one mile of the Blue River north of Town.

C.4.6 Opportunities for Enhancement

Based on the capability assessment, Breckenridge has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the Town to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM. Additional training opportunities will help to inform Town staff and Town Council on how best to integrate hazard information and mitigation projects into the Town policies and ongoing duties of the Town. Continuing to train Town staff on mitigation and the hazards that pose a risk to the Town will lead to more informed staff members who can better communicate this information to the public. Another capability enhancement would be to consider joining the CRS, which would require enhancements to the Town's floodplain management program. This could potentially make flood insurance more affordable.

C.5 Mitigation Goals and Objectives

Breckenridge had adopted the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

C.6 Mitigation Actions

The planning team for Breckenridge identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Continued Compliance with the National Flood Insurance Program.

Breckenridge will continue participation in and compliance with the National Flood Insurance Program. Specific activities that the Town will undertake to continue compliance include the following; some are specified under Town Code Ordinances such as No. 24, chapter 3 (published in 2018):

- Working with FEMA and the Colorado Water Conservation Board in the review and adoption of new digital flood insurance rate maps (DFIRMs) which was done with new effective mapping that became available in 2018.
- Reviewing the flood damage prevention ordinance and identifying opportunities to strengthen requirements and enforcement when adopting new DFIRMs
- Consider joining the Community Rating System after adopting the new DFIRMs and updating the floodplain ordinance
- Continuing strong enforcement of the floodplain ordinance and working with developers and property owners to understand the program
- Restoring a section of the Blue River damaged by past mining activities to improve overall ecological functions of the river and floodplain

Mitigation Action: Breckenridge—1 Culvert Inspections

Jurisdiction:	Town of Breckenridge
Action Title:	Inspect metal culverts to determine risk of failure
Hazard(s) Mitigated	Flood
Priority:	High
Issue/Background:	Failure of culverts could lead to potential flooding issues or road collapse.
Ideas for Implementation:	The Town of Breckenridge would hire an inspection company to inspect metal culverts throughout the Town to determine risk of failure.
Responsible Agency:	Town of Breckenridge
Partners:	Colorado Department of Transportation Summit County Road and Bridge Department
Potential Funding:	Town of Breckenridge; other unknown
Cost Estimate:	$50,000 for consultation services
Benefits: (Losses Avoided)	• Reliable culverts for water to move through reducing the risk of flooding • Mitigated risk of water moving across roadways, which could lead to damage or collapse • Passable transportation corridors
Timeline:	Annual Implementation
Status:	Ongoing. Culverts are inspected annually.

Mitigation Action: Breckenridge—2 Erosion Traps

Jurisdiction:	Town of Breckenridge
Action Title:	Install erosion traps
Hazard(s) Mitigated	Erosion/Deposition, Flood
Priority:	High
Issue/Background:	Erosion hazards can contaminate the water supplies to the Breckenridge. The hazard could be severe after a wildfire.
Ideas for Implementation:	Install erosion traps throughout the valley to catch erosion silt that could contaminate water supplies to the Town of Breckenridge.
Responsible Agency:	Town of Breckenridge
Partners:	Breckenridge Water and Sanitation District
Potential Funding:	Town of Breckenridge; other unknown
Cost Estimate:	$1,000,000 (+)
Benefits: (Losses Avoided)	• Reduce impacts to water quality from erosion hazards • Sustain healthy water sources for the Town of Breckenridge • Continue to provide water services after a wildfire
Timeline:	Ongoing projects completed as necessary.
Status:	Ongoing. Erosion traps are installed as necessary. Sediment detention improvements.

Mitigation Action: Breckenridge—3 Defensible Space and Beetle-Infested Trees

Jurisdiction:	Town of Breckenridge
Action Title:	Promote defensible space and removal of beetle-infested trees
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	Wildfire risk is high in several neighbourhoods in Breckenridge and public policy and education promoting defensible space could be further improved.
Ideas for Implementation:	Create public policy and public education initiatives enforcing 15 feet of defensible space around homes. Public policy would be accomplished by the passing of ordinances by the Breckenridge Town Council. This would include development of mitigation rules and guidelines for the removal of beetle kill trees within the determined defensible space perimeter. Public education would be accomplished by hiring a production company to produce public service announcements for local television stations and radio stations and through awareness articles published in a biannual newsletter to citizens of Breckenridge. This action may also include the development of a program to subsidize homeowners for their compliance efforts, in the form of reforestation assistance or assistance in the removal of beetle kill trees
Responsible Agency:	Town of Breckenridge
Partners:	Red, White, and Blue Fire Protection District
Potential Funding:	U.S. Forest Service, Town of Breckenridge
Cost Estimate:	$250,000
Benefits: (Losses Avoided)	• Creation of a Firewise community • Reduce wildfire risk to people and property
Timeline:	Ongoing
Status:	Ongoing. A defensible space ordinance is in place. All new construction must create defensible space as part of the project as of January 1, 2011 (Ordinance 1, 2011). The Mountain Pine Beetle Ordinance requires all property owners to remove dead and infested trees by July 15th annually (Ord. 13, 2010).

Mitigation Action: Breckenridge—4 Winter Preparedness Kits

Jurisdiction:	Town of Breckenridge
Action Title:	Educate public about winter preparedness kits
Hazard(s) Mitigated	Severe Winter Weather
Priority:	High
Issue/Background:	Severe winter weather is a priority hazard in Breckenridge, where frequent cold temperatures, high winds, and heavy snow events can make travel very dangerous for citizens and visitors.
Ideas for Implementation:	The Town of Breckenridge would hire a production company to educate the public on preparing household winter preparedness or survival kits to have readily available during times of severe winter weather. These public service announcements would be run on local television and radio stations. The Town would partner with local merchants/grocers to educate the public about the types of supplies to include in the kits. The Town would host Winter Preparedness Kit sessions at local grocery stores, demonstrating a prepared kit, in addition to distributing a "shopping list" of items they can purchase while at that location.
Responsible Agency:	Town of Breckenridge Police Department
Partners:	Local merchants
Potential Funding:	Town of Breckenridge, donation from local merchants
Cost Estimate:	$20,000
Benefits: (Losses Avoided)	• Reduce number of cars/citizens on roadways during times of severe winter weather, as supplies would be kept in homes • Sustain food resources in local markets in the event deliveries to the area become impaired by road and weather conditions
Timeline:	2009-2013
Status:	**Completed**

Mitigation Action: Breckenridge—5 Evacuation Planning

Jurisdiction:	Town of Breckenridge
Action Title:	Update and enhance evacuation plan
Hazard(s) Mitigated	Multi-Hazard
Priority:	Low
Issue/Background:	Evacuation of Town residents along Highway 9 (northbound and southbound) in the event of an emergency is a major concern. There are two areas that seriously impact the possible speed of any evacuation. One is the development at the base areas of Peaks 7 and 8, which would have to enter into the Town limits before being able to leave the area. The other is the Block 11 planned development on Airport Road in Breckenridge, which consists of more than 400 units.
Ideas for Implementation:	Update and expand upon current evacuation plans, such as egress and ingress routes. The enhanced plan would focus on high occupancy complexes and population centers and would include awareness notification, wayfinding, and sheltering options. Once the evacuation plans are developed, they will be reproduced in book form and distributed to all first responders (fire, police and EMS personnel).
Responsible Agency:	Town of Breckenridge Police Department
Partners:	Red, White, and Blue Fire Protection District Summit County Sheriff's Department
Potential Funding:	Staff time
Cost Estimate:	$10,000
Benefits: (Losses Avoided)	Planned, safe, and effective evacuation of at risk populations during times of disaster.
Timeline:	2009-2013
Status:	**Completed**

Mitigation Action: Breckenridge—6 Hazardous Materials Mapping and Planning

Jurisdiction:	Town of Breckenridge
Action Title:	Inventory and map locations of hazardous materials
Hazard(s) Mitigated	Hazardous Materials Release
Priority:	Low
Issue/Background:	Locations of hazardous materials need to be better understood by emergency responders.
Ideas for Implementation:	The Town of Breckenridge would hire a consultant to compile an inventory of hazardous materials processes and their storage (i.e. bodyshops, woodworking businesses, plastics fabrication, pool and spa water treatments, etc.). These locations would be mapped and provided to first responders.
Responsible Agency:	Town of Breckenridge
Partners:	Red, White, and Blue Fire Protection District, Summit County Local Emergency Planning Committee
Potential Funding:	TBD
Cost Estimate:	$20,000
Benefits: (Losses Avoided)	• Improve responder knowledge of potential hazardous material release • Identify of populations at risk
Timeline:	--
Status:	Ongoing by fire department

Mitigation Action: Breckenridge—7 Portable Wayfinding Signage

Jurisdiction:	Town of Breckenridge
Action Title:	Locate portable wayfinding signage around Town during emergency events
Hazard(s) Mitigated	Multi-Hazard
Priority:	Low
Issue/Background:	During emergency events, communication with the public is essential. Communication could be enhanced through using wayfinding signage.
Ideas for Implementation:	Purchase portable "wayfinding" signage to place throughout the Town of Breckenridge to assist citizens and guests with navigation in times of disaster. Additionally, it would be necessary to purchase a trailer to store the signage and make ready the rapid deployment of it during times of need.
Responsible Agency:	Town of Breckenridge
Partners:	
Potential Funding:	Town of Breckenridge
Cost Estimate:	$15,000 for the creation of signage and purchase of the trailer
Benefits: (Losses Avoided)	Improve safety of citizens during emergency events
Timeline:	
Status:	**Completed.**

Mitigation Action: Breckenridge—8 Emergency Generators

Jurisdiction:	Town of Breckenridge
Action Title:	Emergency generator power connections at pump stations
Hazard(s) Mitigated	Multi-Hazard
Priority:	Low
Issue/Background:	Quick connections and manual transfer switches for temporary power generators are needed during long term power outage at pump stations in order to fill water tanks.
Ideas for Implementation:	Received quotes from two local industrial electrical contractors.
Responsible Agency:	Town of Breckenridge Water Division, Gary Roberts, Water Division Manager
Partners:	None
Potential Funding:	Town of Breckenridge Water Fund-2014 Budget
Cost Estimate:	$100,000
Benefits: (Losses Avoided)	Fill water tanks to sustain fire protection of structures during long term power outage.
Timeline:	
Status:	**Completed.** Action added in 2013.

Mitigation Action: Breckenridge—9 Wildfire Prevention and Watershed Protection Plan

Jurisdiction:	Town of Breckenridge
Action Title:	Wildfire Prevention and Watershed Protection Plan
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	The Town of Breckenridge produced a Forest Health Plan with proposed fuels treatments for the Breckenridge area. During the planning for that effort in conjunction with the pine beetle epidemic, the Town had increased concerns over vulnerability for the Town's sole water source, the Goose Pasture Tarn. According to the Blue River Watershed Assessment prepared by JW Associates, the drainages south of the Tarn are within a zone of concern, classified as Category 5. The Town then secured a grant for the USGS to produce a debris flow study in a post fire setting for this area. This narrowed down particular areas within Indiana Gulch which were highest risk post-fire to the Goose Pasture Tarn. The Town then hired Tetra Tech to complete a more detailed study and plan for Wildfire Prevention and Watershed Protection which resulted in a plan adopted by the Town of Breckenridge. This preplanning effort identifies forest treatment areas in a pre-fire condition as well as immediate remediation efforts post fire to assist the BAER team after a burn. The Town of Breckenridge and the USFS entered into a formal MOU in 2017 acknowledging the plan and partnership between the two entities.
Ideas for Implementation:	
Responsible Agency:	Town of Breckenridge Assistant Community Development Director
Partners:	Town of Breckenridge, USFS. (Input on project from USFS, BAER Team rep, NRCS rep)
Potential Funding:	Town of Breckenridge self funded for planning efforts of the plan. The USFS has self funded some fire mitigation efforts post MOU. The Town of Breckenridge recently acquired a $30,000 grant from the Summit County Wildfire Council for an aquatic organism passage and road restoration project for 2020.
Cost Estimate:	The plan has many pre-fire mitigation action items. The item for 2020 is for an aquatic organism passage and road restoration project for 2020 which will result in stream health improvements, water quality protection totaling $40,000 plus USFS in kind design and labor.
Benefits: (Losses Avoided)	Based on other municipalities which have experienced wildfire in their watersheds and primary water sources, the Town stands to save millions of dollars with preplanning mitigation efforts to ideally avoid a drastic wildfire as well as post-fire recommendations specific to Indiana Gulch watershed area to allow to Town and/or the USFS to act quickly after a heavy rain event to minimize sludge and sedimentation impacts to the Town's water supply in Goose Pasture Tarn.
Timeline:	The MOU was completed in 2017. Pre-fire implementation is currently ongoing.
Status:	In process. Action added in 2013.

Mitigation Action: Breckenridge —10 Goose Pasture Dam Rehabilitation

Jurisdiction:	Town of Breckenridge
Action Title:	Rehabilitation of Goose Pasture Tarn Dam
Hazard(s) Mitigated	Dam Failure
Priority:	High
Issue/Background:	Rehabilitation of Goose Pasture Tarn Dam, located on the Blue River and in the Town of Blue river approximately two miles south of the Town of Breckenridge, is planned to start in May 2020 and be completed by the fall of 2022. The Colorado State Engineers Office (SEO) and Engineers working for the Town of Breckenridge have identified dam safety concerns, and the dam is currently under a lower reservoir restriction level imposed by the SEO until rehabilitation measures to improve dam safety have been implemented. The measures generally include replacement of two existing spillways with a single spillway, construction of a downstream drainage system, and lining of the outlet works conduit among other measures.
Ideas for Implementation:	
Responsible Agency:	Town of Breckenridge Public Works
Partners:	Summit County, Town of Blue River, SEO
Potential Funding:	FEMA, FEMA High Hazard Potential Dam Program; The Town of Breckenridge is working with FEMA to obtain a FEMA grant to help fund the project, in addition to obtaining low-interest rate from CWCB.
Cost Estimate:	$18-22M
Benefits: (Losses Avoided)	Reduced potential for failure and downstream impacts in Breckenridge
Timeline:	2020-2022
Status:	New in 2020

Mitigation Action: Breckenridge— 11 Coyne Valley Culvert Replacement

Jurisdiction:	Town of Breckenridge
Action Title:	Coyne Valley Road Culvert Replacement
Hazard(s) Mitigated	Flooding
Priority:	High
Issue/Background:	The existing culverts that pass the Blue River under Coyne Valley Road are not adequately sized for a 100-year flood event.
Ideas for Implementation:	The triple corrugated metal pipes are planned for replacement with a single concrete arch culvert sized for a 100-year flood.
Responsible Agency:	Town of Breckenridge Public Works
Partners:	
Potential Funding:	Town of Breckenridge Capital Fund
Cost Estimate:	$3.5 M
Benefits: (Losses Avoided)	This project will decrease the chance that the river flows will overtop the roadway, decreasing the chance for road closure/loss and erosion that may damage existing utilities in the right of way.
Timeline:	Construction targeted for 2021.
Status:	New in 2020. Design completed. Construction contract not yet awarded.

C.7 Implementation and Maintenance

Moving forward, the Town will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

C.7.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Town to help inform updates and the development of local plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

The HMPC did not identify the incorporation of the 2013 hazard mitigation plan into Town plans and planning mechanisms although moving forward the Town will consider the hazard information in this 2020 plan when updated the Town's planning mechanisms.

Process Moving Forward

Moving forward, the Engineering Division may utilize the hazard information when implementing the Town's Capital Improvement Plan and the Planning and Zoning Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The Town will also incorporate this HMP into future updates to the Town of Breckenridge Comprehensive Plan.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Breckenridge will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

C.7.2 Monitoring, Evaluation and Updating the Plan

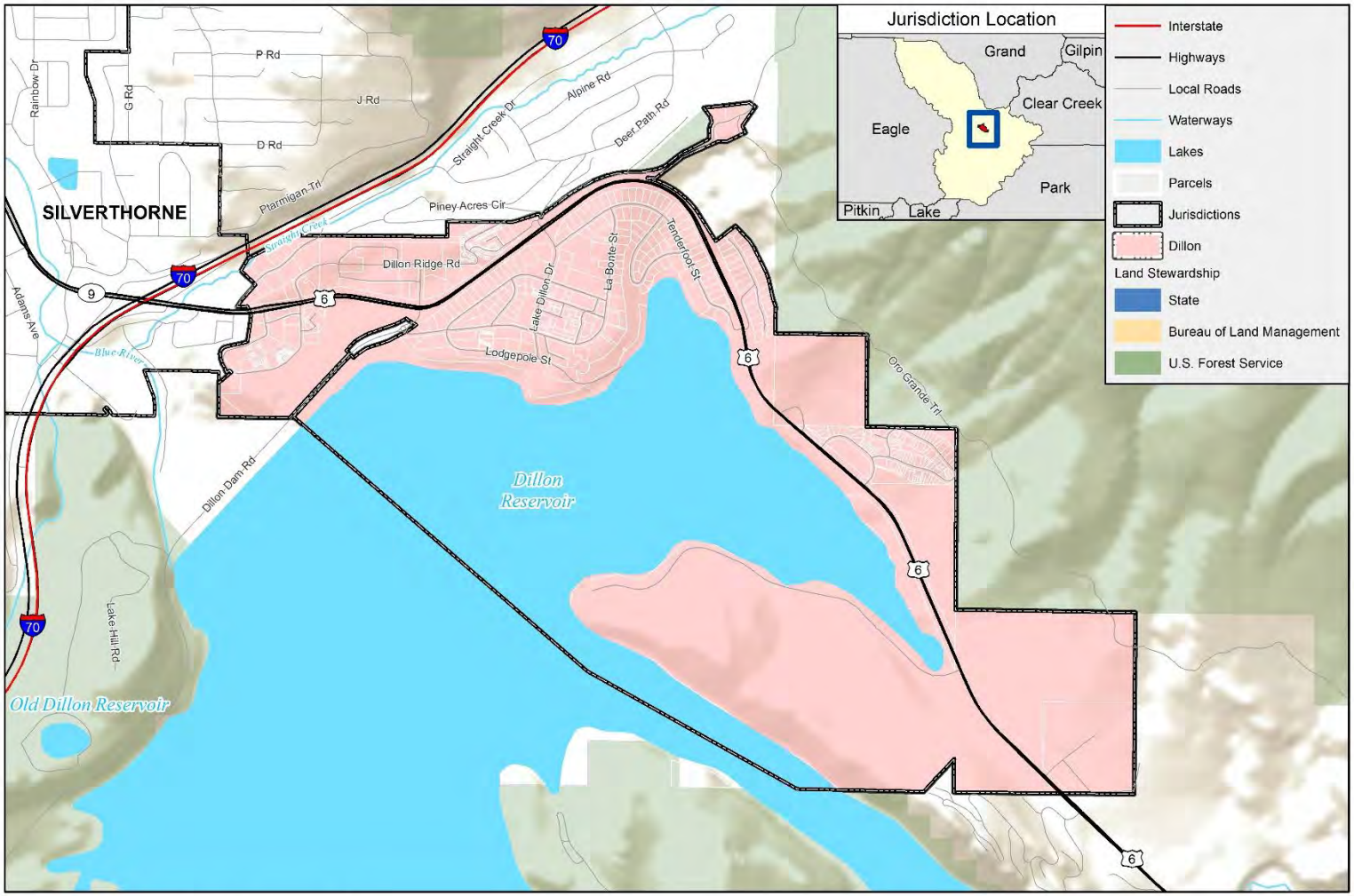
The Town will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The Town will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The Town Manager will be responsible for representing the Town in the County HMPC, and for coordination with Town staff and departments during plan updates. The Town realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

ANNEX D: TOWN OF DILLION

D.1 Community Profile

Figure D-1 shows a map of the Town of Dillon and its location within Summit County.

Figure D-1 Town of Dillon



D.1.1 Geography

The Town of Dillon is located in central Summit County on the north shore of Dillon Reservoir directly south of Interstate 70 (I-70). Straight Creek runs in a southwesterly direction along the northern boundary of the Town. Dillon's total area is 2.3 square miles and the nearest city is Silverthorne, approximately two miles north on the opposite side of I-70. The elevation is 9,087 feet and the climate is typified by cold winters and temperate summers.

D.1.2 Population

The estimated 2017 population of the Town of Dillon was 1,062, a 40.3% increase since 2012. Select U.S. Census American Community Survey (ACS) demographic and social characteristics for Dillon are shown in the following tables and figures.

Table D-1 Dillon Demographic and Social Characteristics 2012-2017

Dillon	2012	2017	% Change
Population	757	1,062	40.3%
Median Age	39.4	47	19.3%
Total Housing Units	1,664	1,403	-15.7%
Housing Occupancy Rate	22.8%	33.1%	45.2%
% of Housing Units with no Vehicles Available	8.2%	7.7%	-6.1%
Median Home Value	$415,500	$484,800	16.7%
Unemployment	2.4%	5.7%	137.5%
Mean Travel Time to Work (minutes)	16.7	17	1.8%
Median Household Income	$54,875	$60,568	10.4%
Per Capita Income	$42,654	$44,956	5.4%
% Without Health Insurance	16.5%	9.4%	-43.0%
% of Individuals Below Poverty Level	6.9%	10.0%	44.9%
# of Households	380	465	22.4%
Average Household Size	1.99	2.28	14.6%
% of Population Over 25 with High School Diploma	95.0%	96.8%	1.9%
% of Population Over 25 with Bachelor's Degree or Higher	62.1%	49.9%	-19.6%
% with Disability	2.2%	11.8%	436.4%
% Speak English less than "Very Well"	7.0%	3.8%	-45.7%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table D-2 Demographic and Social Characteristics Compared to the County and State

Demographic & Social Characteristics (as of 2017)	Dillon	Summit County	Colorado
Median Age	47	39	36
Housing Occupancy Rate	33.1%	30.80%	89.80%
% of Housing Units with no Vehicles Available	7.7%	1.60%	5.30%
Median Home Value	$484,800	$547,700	$286,100
Unemployment	5.7%	2.60%	5.20%
Mean Travel Time to Work (minutes)	17	16.4	25.2
Median Household Income	$60,568	$73,538	$65,458
Per Capita Income	$44,956	$37,192	$38,845
% Without Health Insurance	9.4%	21.40%	9.40%
% of Individuals Below Poverty Level	10.0%	10.30%	11.50%
Average Household Size	2.28	3.1	2.55
% of Population Over 25 with High School Diploma	96.8%	93.40%	91.10%
% of Population Over 25 with bachelor's degree or Higher	49.9%	47.80%	39.40%
% with Disability	11.8%	6.10%	10.60%
% Speak English less than "Very Well"	3.8%	7.50%	6.00%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table D-3 Demographics by Race and Sex

Dillon	Population	%
Total Population	1,062	
Male	495	46.6%
Female	567	53.4%
White, not Hispanic	672	63.3%
Hispanic or Latino	270	25.4%
Black	47	4.4%
Asian	22	2.1%
American Indian and Alaska Native	27	2.5%
Native Hawaiian and Other Pacific Islander	71	6.7%
Some other race	53	5.0%
Two or more races	40	3.8%

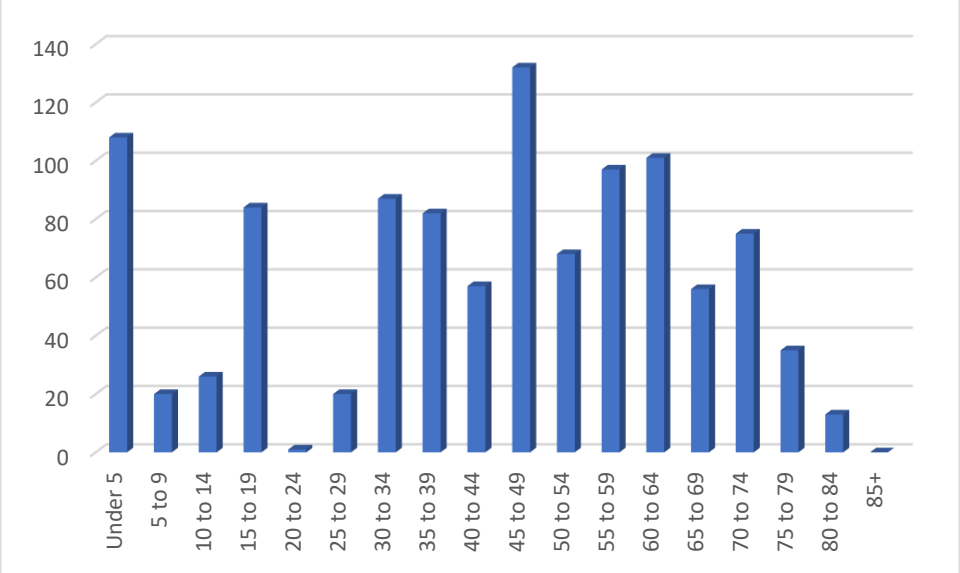
Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table D-4 Types and Total Amounts of Housing Units in Dillon

Type of housing units	Total	Percentage
Total housing units	1,403	
1-unit detached	162	11.5%
1-unit attached	142	10.1%
2 units	38	2.7%
3 or 4 units	78	5.6%
5 to 9 units	105	7.5%
10 to 19 units	273	19.5%
20 or more units	602	42.9%
Mobile home	3	0.2%
Boat, RV, van, etc.	0	0.0%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Figure D-2 Age Distribution in Dillon



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

D.1.3 History

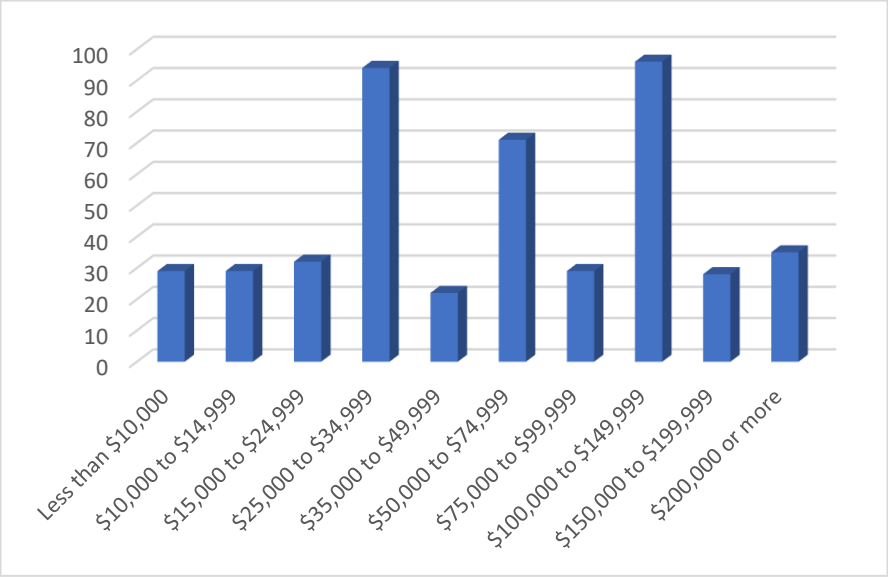
The Town of Dillon was first incorporated in 1883. Originally, three rivers came together where a trading post and clusters of cabins existed. This was the scene in the late 1800s until Denver needed water storage in the high country. In 1963 a water storage project was completed for the Denver metropolitan area which created Dillon Reservoir. The Town had to relocate to the northeastern shore of the reservoir while the reservoir was completed. The creation of the reservoir, the completion of the Eisenhower Tunnel in the 1960s, and the incorporation of the neighboring Town of Silverthorne all helped to establish Dillon's modern historical era.

D.1.4 Economy

According to 2017 Census Bureau estimates, the industries that employed the highest percentages of Dillon's labor force were arts, entertainment, recreation, accommodation, and food services (20.1%); professional, scientific, and management, and administrative and waste management services (16.4%); finance, insurance, real estate, and rental and leasing (12.4%); and educational, health, and social services (11.3%).

As shown in Table D-2, per capita income in Dillon was $44,956 in 2017, which is roughly 20% above average for both Summit County and the State of Colorado. A breakdown of Dillon's income distribution is shown in Figure D-3.

Figure D-3 Income Distribution in Dillon



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

D.2 Hazard Identification and Profiles

Dillon's planning team identified the hazards that affect the community and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and planning significance specific to the Town (see Table D-5). In the context of the countywide planning area, there are no hazards that are unique to Dillon.

Table D-5 Dillon Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Medium	Unlikely	Critical	Medium
Drought	Large	Likely	Limited	Low
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Medium	Likely	Limited	Medium
Flood	Isolated	Unlikely	Limited	Low
Hazardous Materials Release (Transportation)	Isolated	Occasional	Critical	High
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Unlikely	Limited	Low
Lightning	Large	Likely	Critical	Medium
Pest Infestation (Forest and Aquatic)	Small	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Critical	High
Wildfire	Small	Occasional	Critical	Medium
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Medium

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

D.3 Vulnerability Assessment

The intent of this section is to assess Dillon's vulnerability separate from that of the planning area (i.e. Summit County) as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk to hazards ranked of medium or high significance based on the specific community in question (i.e. Dillon). For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan.

D.3.1 Community Asset Inventory

Table D-6 shows the total number of improved parcels, properties, and their improvement and content values for the Town of Dillon. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, 100% for Commercial structures, and 0% for Exempt parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table D-6 Dillon Improved Parcel and Property Exposure

Parcel Type	Parcel Totals	Total Properties*	Improved Value	Content Value	Total Value
Commercial	44	131	$53,174,871	$53,174,871	$106,349,742
Exempt	89	120	$0	--	$0
Residential	410	1,273	$596,994,808	$298,497,404	$895,492,212
TOTAL	**543**	**1,524**	**$650,169,679**	**$351,672,275**	**$1,001,841,954**

Source: Summit County Assessors Data, November 2019.

*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table D-7 lists summary information about the 9 critical facilities and other community assets identified by Dillon's HMPC as important to protect or provide critical services in the event of a disaster. Table D-8 details more information on the critical facilities in question found in the town and considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, to estimate whether it might be at risk of the various hazards assessed. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the main plan HIRA document.

Table D-7 Dillon Critical Facilities

FEMA Lifeline	Critical Facility Type	Total
Food/Water/Shelter	Wastewater Facilities	1
Hazardous Materials	HazMat Tier II SARA Facilities	1
Health and Medical	Ambulance Stations	1
Other/Schools	Schools	1
Safety and Security	Fire Station	1
	Government Buildings	3
	Police Stations	1
TOTAL		9

Source: Summit County GIS, Summit County HMPC.

Table D-8 Detailed List of Critical Facilities and Infrastructure in Dillon

FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location /Notes
Food/Water/Shelter	Wastewater Facilities	Dillon Treatment Plant	
Hazardous Materials	HazMat Tier II SARA Facilities	CenturyLink Communications - Dillon Central Office	186 W Buffalo St, Dillon 80435
Health and Medical	Ambulance Stations	Lake Dillon FPD and Ambulance	225 Lake Dillon Dr, Montezuma, CO 80435
Other/Schools	Schools	Colorado Mountain College - Dillon	
Safety and Security	Fire Station	Summit Fire Station 8	225 Lake Dillon Drive, Dillon 80435
	Government Buildings	Dillon Town Hall	$2.5M
		USPS Dillon	
		Dillon Public Works	
	Police Stations	Dillon Police Department	275 Lake Dillon Dr, Dillon 80435;

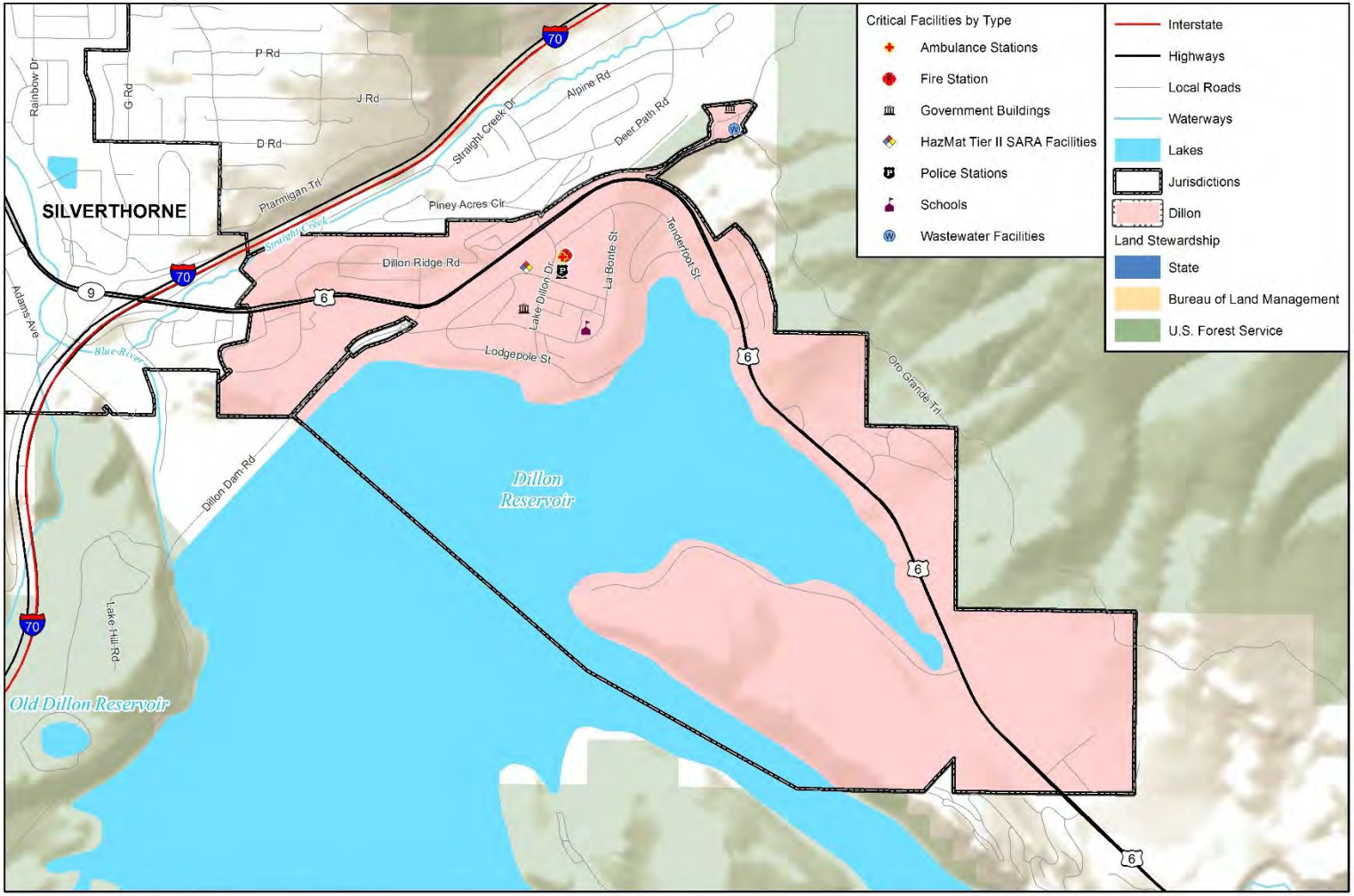
Source: Summit County GIS, Summit County HMPC.

The locations of critical facilities in Dillon identified by Summit County are illustrated in Figure D-4.

The past 2013 HMP noted, in addition, the following critical facility and other community asset replacement values to provide a general guideline of possible costs incurred if these Dillon facilities were affected by various hazards.

- MGD Water Treatment Plan: $4.75 Million – 5/1.5 millions of gallons per day
- Gold Run Sewage Lift Station: $1 Million
- Elevated Water Storage Tank: $500,000 – 400,000 gallons
- Buried Water Storage Tank: $750,000 – 500,000 gallons
- Public Works Maintenance Building: $500,000
- Dillon Valley Emergency Water Interconnect: $ 150,000
- Silverthorne Emergency Water Interconnect: $200,000
- Straight Creek Water Diversion: $150,000
- Old Dillon Reservoir: $4.77 Million

Figure D-4 Critical Facilities and Infrastructure in Dillon



Map compiled 11/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, HIFLD

D.3.2 Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan.

- Drought
- Earthquake
- Flood
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Only Dam Failure, Erosion/Deposition, Hazardous Materials Release (Transportation), and Wildfire, hazards will be profiled in the following vulnerability assessment sections, due to vulnerability and applicable context. The Town of Dillon does not have any Special Flood Hazard Areas identified in the FEMA National Flood Hazard Layer. Therefore, the Town has no property or critical facilities at risk to flooding. The HMPC only knew of one area where flooding sometimes occurs, which is Little Beaver Creek near I-70 and the Town of Silverthorne. Flooding sometimes occurs when a beaver dam is built up and backs up water. In this case, the Public Works department removes the dam.

Dam Failure

General Property

The Dillon Dam is a High hazard structure located just southwest of the Town of Dillon, on the north-northwest corner of the Dillon Reservoir. It has a maximum storage capacity of 305,000 acre-feet as of 2018 records.

While there is no specific data available to indicate any likelihood of failure, based on best available dam inundation data there might be structures potentially at risk of dam failure flooding. The dam failure inundation maps contain sensitive information and are not available for display in this public planning document. Based on a GIS analysis performed with the county parcel layer and the available dam inundation mapping (for planning purposes only), the following potential damages would be expected in the Town of Dillon. Note that additional details on the GIS analysis methodology, data preparation process, and other helpful information for understanding how vulnerability assessment results were obtained can be found in Section 3.3. Vulnerability Assessment within the main plan HIRA document.

Table D-9 Estimated Dam Inundation Risk to Properties in Dillon

Parcel Type	Total Properties Exposed	Improved Value	Content Value	Total Value	Population Exposed
Commercial	23	$11,208,565	$11,208,565	$22,417,130	--
Residential	51	$28,096,811	$14,048,406	$42,145,217	158
TOTAL	74	$39,305,376	$25,256,971	$64,562,347	158

Source: Summit County GIS and Assessor's Office, U.S Census, Wood Analysis

People

Based on the GIS analysis summarized in the table above, it is expected that around 158 people in Dillon might be at risk of dam inundation hazards. These totals were estimated by multiplying the average number of persons per household in Summit County (which equals 3.10) times the number of residential properties where dam inundation extents were available.

Critical Facilities and Infrastructure

Based on the critical facility inventory considered in the updating of this plan and intersected with the dam inundation extents available for the Town of Dillon, no critical facilities were found to be at risk.

Economy

A dam inundation event that affected the major roads which give access to the town (e.g. Interstate 70, U.S. Highway 6) could significantly affect the local economy, by limiting or completely impeding access to shops, restaurants, hotels, and other major industries which keep the local economy thriving.

Historical, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. For the most part the environment is resilient and would be able to rebound, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would.

Future Development

Flooding due to a Dillon Dam failure event is a low probability event and the area at risk is already urbanized, so future development is not anticipated to change vulnerability to the hazard.

Hazardous Materials Release

The only Tier II hazardous materials facility within Dillon town limits is the CenturyLink Communications Center, as shown in Table 3-11 in the base plan. Both I-70 and U.S. 6 are significant hazardous materials transportation routes. Hazardous materials vulnerability is considered high due to the traffic on I-70 and the diversions on U.S. 6 through town due to the hazmat restrictions at the Eisenhower/Johnson tunnels.

Wildfire

General Property

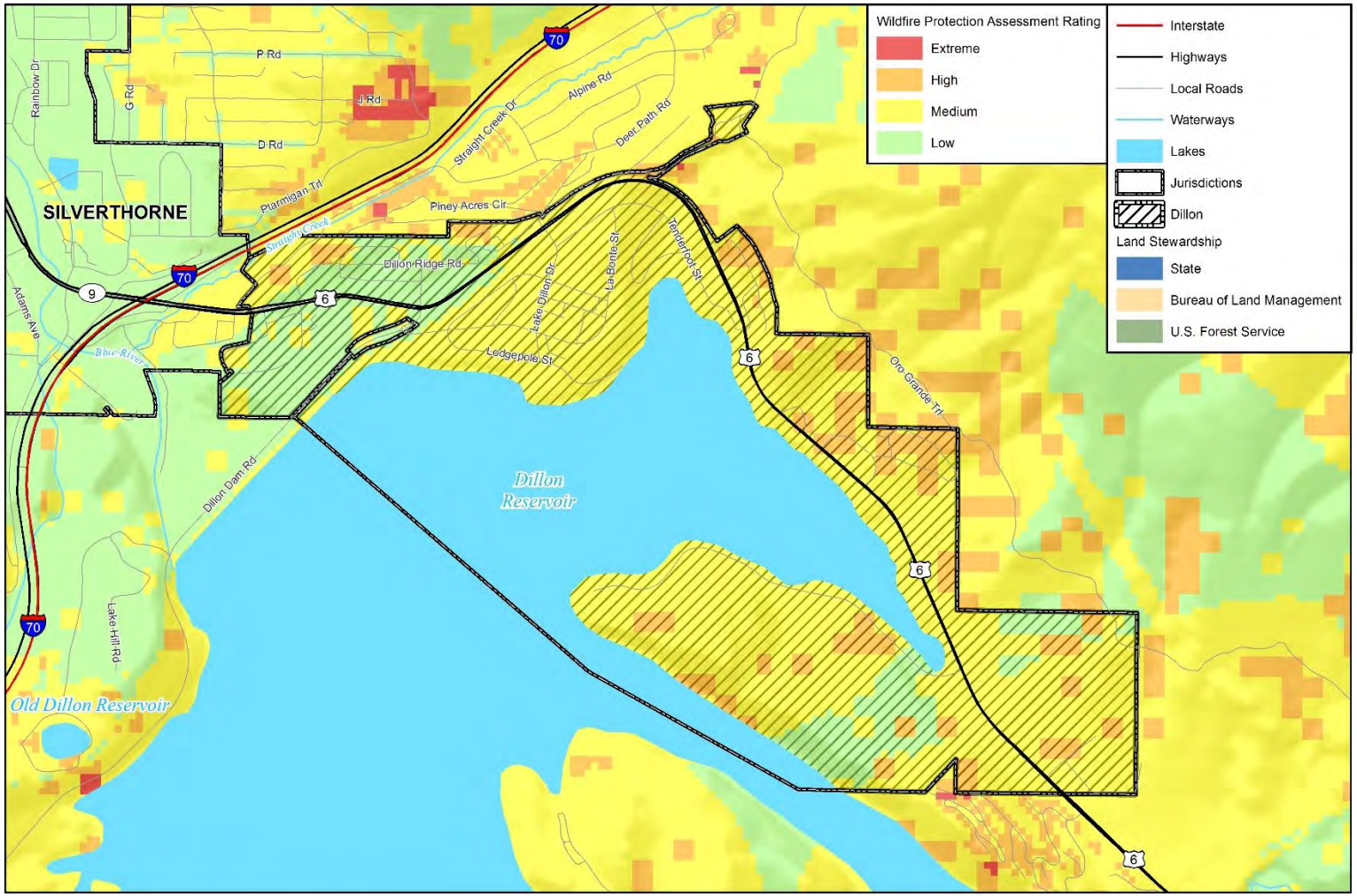
Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which breaks up areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in Dillon. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. From the improvement values were the content values calculated next, as a percentage of property improvement values based on their occupancy type (using FEMA Hazus guidance as follows): Residential parcels received content values worth 50% of their improvements; Commercial parcels received content values worth 100% of their improvements; and Exempt parcels received content values worth 0% of their improvements. Property improvements and content values were then totaled to arrive at the Total Value column, which is also the estimated value at risk based on FEMA loss curve standards for wildfire hazards. Dillon was found to intersect with wildfire areas rated as Medium and High, and exposed property information is summarized by property type in Table D-10 below. Wildfire protection assessment areas for Dillon are displayed in Figure D-5.

Table D-10 Property Values in Wildfire Zones by Parcel Type, Dillon

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Commercial	88	22,918,293	22,918,293	$45,836,586	-
Exempt	19	-	-	$0	-
Residential	1,186	545,685,700	272,842,850	$818,528,550	3,677
TOTAL	1,293	$568,603,993	$295,761,143	$864,365,136	3,677

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis

Figure D-5 Wildfire Protection Assessment areas and Ratings in Dillon



People

The last column of Table D-10 above summarizes the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted, Dillon has an estimated 3,677 people at risk of Medium and High rated wildfire zones. These totals were estimated by multiplying the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire zones in Dillon.

However, smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

All 9 critical facilities located in Dillon are found in either Medium or High wildfire threat areas. Since all the facilities profiled in this plan update were already discussed in the Community Asset Inventory subsection of this annex, more details are available in Table D-7 and Table D-8. These are summarized again in the bullet points below for reference:

- Food/Water/Shelter:
  - Wastewater Facilities: Dillon Treatment Plant
- Hazardous Materials:
  - HazMat Tier II SARA Facilities: CenturyLink Communications (Dillon Central Office)
  - Health and Medical: Lake Dillon FPD and Ambulance Station
- Other/Schools: Colorado Mountain College in Dillon
- Safety and Security:
  - Fire Station: Summit Fire Station 8
  - Government Buildings: Dillon Town Hall, USPS Dillon, and Dillon Public Works
  - Police Stations: Dillon Police Department

Since 2006, much of the wildfire hazard in Dillon has been reduced as a result of the removal of trees infested with mountain pine beetle. The Town has removed a significant number of infested trees as part of a program managed by the Public Works Department. The Town has been actively participating with the Summit County Wildfire Council in the establishment of a wildland-urban interface map. These efforts allow the County to apply for federal assistance in establishing defensible space around buildings under threat from wildfire. It is important to note the wildfire risk to watersheds, which can impact Dillon and most of the other jurisdictions. In particular, the risk to the watershed on USFS property to the northeast of Dillon is considerable.

The Summit Fire & EMS Authority, which provides fire protection services to the Town of Dillon and surrounding area, is considered an initial attack center for wildland fires on all private land and takes a joint responsibility with the U.S. Forest Service for fires on federal land.

Economy

Tourism, the accommodation and food services industry (e.g. hotels and restaurants), and retail are major components of Summit County's economy, and Dillon's as well. Wildland fires can, for example, lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation, stays in hotels, spending on restaurants and other commerce sources, and more.

Historical, Cultural, and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after the fire.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important historical assets in Dillon.

Future Development

Chapter 18 of the Dillon Municipal Code specifies building codes and mitigation measures for development in high wildfire hazard areas. The comprehensive plan also has policies related to assisting homeowners in creating defensible space around homes and continuing to remove and replace beetle kill trees throughout Town.

D.3.3 Growth and Development Trends

Table D-11 illustrates how Dillon has grown in terms of population and number of housing units between 2011 and 2017.

Table D-11 Change in Population and Housing Units in Dillon, 2012-2017

2012 Population	2017 Population	Population Percent Change 2012-2017	2012 Total Housing Units	2017 Total Housing Units	Estimated Percent Change 2012-2017
757	1,062	40.3%	1,664	1,403	-15.7%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Dillon is surrounded by the Dillon Reservoir, I-70, and open space, and there is not a significant amount of new residential development occurring. New commercial development is planned in the Dillon Ridge Shopping Center. A goal of the Town's Comprehensive Plan is to provide open space throughout the community in order to protect features that are unique to Dillon, particularly open space along Dillon Reservoir and the hillsides that frame the existing community. Future goals include redevelopment of the Core area zone district of the Town.

D.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

D.4.1 Regulatory Mitigation Capabilities

Table D-12 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Dillon.

Table D-12 Dillon—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	Being reviewed in 2020
Zoning Ordinance	Yes	Ongoing multi-year 3rd party review started in 2018
Subdivision Ordinance	Yes	Ongoing multi-year 3rd party review started in 2018
Growth Management Ordinance	No	
Floodplain Ordinance	No	
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	Yes	
Building Code	Yes	2018 ICC/IFC adopted in 2019
Fire Department ISO Rating	Yes	Rating: 4
Erosion or Sediment Control Program	Yes	
Stormwater Management Program	Yes	
Site Plan Review Requirements	Yes	
Capital Improvements Plan	Yes	Five-Year Capital Improvement Plan updated each year
Economic Development Plan	Yes	Urban Renewal Authority formed in 2009
Local Emergency Operations Plan	No	Incorporated in Summit County Emergency Operations Plan
Other Special Plans	Yes	Forest Management Plan
Flood Insurance Study or Other Engineering Study for Streams	No	No SFHAs identified for Dillon in Summit County FIS dated November 16, 2018
Elevation Certificates	No	

Town of Dillon Comprehensive Plan, 2017

The primary purpose of the Dillon Comprehensive Plan is to provide a framework for decision making which encourages public and private decisions be made in a manner that enhances the livability of the community, by adopting goals and policies that encourage local development decisions that are in the best interest of the community. Goals and policies of the Comprehensive Plan related to hazard mitigation are listed below and address the hazards of wildfire, flood, landslide, erosion/deposition, and drought.

Goal: To protect the environment and improve it whenever and wherever possible.

- Discourage development within or adjacent to areas identified as potential hazardous areas (steep slopes, unstable soils, flood plains, etc.), and developments proposed for any areas considered to pose a hazard should submit engineering investigations of the site and mitigate any potential negative impacts.
- Limit development on slopes of greater than 20% and require engineering investigations of sites over 20% during project review. Development on slopes in excess of 20%, if allowed, should maintain the maximum vegetative cover possible to protect soils, prevent land slippage, and retain wildlife habitat, view corridors and open space resources.
- Require that the implications of any potential geological and geo-technical constraints be appropriately addressed by persons experienced and legally qualified to do so. Such evaluative and mitigation procedures should incorporate analytical and design methods representing current generally accepted professional practices.
- Require proposals for all new developments to recognize the value of existing on-site natural vegetation and inventory, and preserve these resources to the maximum extent feasible, including the preservation of large trees. Every effort should be made to use native plants and to emulate the surrounding mountain landscape. Diversity in tree selection is a priority following the recent mountain pine beetle infestation.
- Encourage new and existing developments to provide adequate measures to control any adverse effects to the water quality and groundwater resources of the region.

Goal: To preserve and foster the unique natural, physical, and man-made characteristics and cultural aspects of Dillon.

- Establish criteria within the Chapter 16 Zoning to encourage new projects to be designed so they do not block views to prominent features such as Dillon Reservoir, the Robert's Peninsula, and other natural and man-made features.
- Inspect and enforce landscape warranties to ensure that vegetation in new developments establishes itself.
- Work with the Division of Wildlife to ensure that new developments minimize adverse impacts on fish and other wildlife habitat, breeding areas, and migration routes in and adjacent to Dillon.
- Preserve shorelines and wildlife habitats from intensive development. If development occurs, developers should be encouraged to develop on land with minor constraints, and utilize clustering of development to minimize development impacts on sensitive areas.

Goal: To preserve community water sources, and the water quality of the community to enhance the livability of the Town.

- Improve the Town's landscaping regulations including the adoption of regulations that would reduce the amount of water utilized for the maintenance of landscaping.
- Continue to enact watering restrictions in times of drought and encourage voluntary water reduction at all times.
- Provide guidance to the community in selection of drought resistant xeriscape plant species. Amend wetland regulations to relate the wetland definition to the Army Corps of Engineer standards and updates.
- Work with Denver Water Board to preserve the areas near the lake to reduce erosion.

- Work to reduce point source pollution that may enter the lake, or other water bodies, including Straight Creek.
- Monitor areas of high mortality due to pine beetle infestation, and take steps to mitigate erosion following tree removal.

Goal: The Town should continue to cooperate in wildfire preparation with other jurisdictions.

- Continue participation in the County Wildfire Council.
- Assist homeowners in creating defensible space around homes.
- Continue to remove and replace beetle kill trees throughout the Town.

Goal: To cooperate with Lake Dillon Fire Rescue (LDFR) to provide a fire protection system that is of high quality and can meet the existing and future needs of the community, and keep fire insurance rates as low as possible in the community.

- Continue to work with the Joint Fire Authority to provide for the community's fire protection needs.
- Continue to provide water lines and maintenance adequate to meet fire flow requirements, and the Town should not allow new developments unless adequate fire protection can be provided.
- Evaluate existing development ordinances to insure they provide adequate measures for fire protection, and modify them if necessary.

Goal: To provide a water distribution and treatment system that meets the current and future needs of the community.

- Continue to look toward the future and provide adequate water rights and storage capacity to meet the future build-out of the community.
- Require new developments to provide the water system improvements needed to meet the water needs of their projects. For single-family homes adjacent to existing water distribution lines, this may be as simple as tapping into the existing water lines and paying the appropriate plant investment fees / tap fees. While for annexation requests and rezoning for uses that utilize additional treated water, the applicant will be required to either provide the necessary facilities or financially guarantee their installation prior to them being needed.
- Ensure that future water system improvements are undertaken in a manner that will be least disruptive to the environment and the community.
- Continue to strive toward conservation of the community's water resources through policies in Town development ordinances.
- Revise the current landscaping regulations and drought response program to reflect best management practices concerning water conservation and the use of drought-tolerant native plant species.

Dillon Municipal Code

The Dillon Municipal Code serves as the legal framework for the Town. Sections related to hazard mitigation are described below.

Chapter 16 Zoning Regulations

The Dillon Municipal Code includes the following policies and guidelines related to development in hazardous areas:

- Sec. 16-3-110 Residential Estate (RE) Zone
  - In a RE zone, the following regulations shall apply: (2) Allowed density. Density shall be calculated at a density of one (1) unit per acre of developable land. Developable land shall include all land within the parcel, minus any area containing slopes over fifteen percent (15%), any wetlands and any land impacted by geologic hazards.
- Sec. 16-5-10 Planned Unit Development Purpose
  - (a) The purpose of a Planned Unit Development (PUD) is to encourage flexibility in the development of land in order to promote appropriate and high quality use; to improve the design, character and quality of new development; to facilitate the adequate and economical provision of streets and utilities; to protect the natural environment and avoid development in hazardous areas; and to provide the appropriate natural and scenic features of open space.

Chapter 17 Subdivision Regulations

The Improvements, Reservations, and Design Standards include the following policies related to hazard mitigation:

- Land which the Town determines to be unsuitable for subdivision or development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, adverse visual impacts or other features which could be harmful to the safety of citizens can not be subdivided or developed unless adequate mitigation methods are in place.
- Development, including the placement of public improvements and the creation of sites for the placement of structures, shall only be allowed on slopes in excess of 15 percent if no other reasonable alternatives exist and the subdivider mitigates any potential negative impacts created by development on these slopes. No development should take place on slopes in excess of 20 percent.
- If a proposed subdivision impacts a flood-prone area: 1) it shall be designed to minimize flood damage within the flood-prone area; 2) all public utilities and facilities, such as sewer, gas, electric and water systems, shall be located and constructed to minimize and eliminate flood damage; and 3) adequate drainage shall be provided to reduce exposure to flood hazards.
- Wetland regulations that limit development activity in and around wetland areas.

Chapter 18 Building Regulations

Chapter 44 of the Building Regulations details fire hazard mitigation requirements for new construction. This includes requirements for roofing and construction materials, as well as defensible space requirements according to the structure's wildland fire hazard level assigned by the Colorado State Forest Service.

- "Section 4404 Required Mitigation.

- "Class A roof. All new construction, including additions, regardless of the designated response zone or the wildfire hazard rating assigned to the property, shall be provided with a Class A roof as defined in R902.
- "Low hazard. Construction in an area with a 'Low' Fire Hazard Rating shall require no additional mitigation measures beyond the installation of a Class A roof.
- "Moderate hazard. Construction in an area with a 'Moderate' Fire Hazard Rating shall provide a defensible space area in accordance with the requirements of this chapter and Table 44-A. Additionally, based upon the higher fire loading potential, structures 6,000 square feet and larger in building size shall be provided with an automatic sprinkler system, and structures 4,000 square feet to 6,000 square feet in building size shall implement a fire-resistive construction measure as defined herein.
- "High hazard. Construction in an area with a 'High' Fire Hazard Rating shall provide a defensible space area in accordance with the requirements of this chapter and Table 44-A. Additionally, structures 4,000 square feet and larger in building size shall be provided with an automatic sprinkler system, and structures ranging from 2,400 square feet up to 4,000 square feet in building size shall implement a fire-resistive construction measure as defined herein.
- "Additions. An addition located in a high or moderate wildfire hazard rated subdivision, added to any structure built before January 1, 2000, will require that a defensible space be provided around the addition as well as the existing structure, in accordance with the requirements of this chapter and Table 44-A. If the building size of the addition itself would require fire-resistive construction by this chapter, the addition shall be of fire-resistive construction but not the existing structure. If the building size of the addition itself would require a sprinkler system under this chapter, the entire building, including the additions, the existing structure and any other applicable structures, must be equipped with a sprinkler system. An addition to a building that was previously required to be of fire-resistive construction or was required to have a sprinkler system or monitored smoke detector system installed will require the same level of protection.
- "Alternates and exceptions to Section 4404.
    - "1) Unless otherwise required by this code, an automatic sprinkler system may be installed in lieu of required fire-resistive construction.
    - "2) A monitored smoke alarm system may be provided in lieu of fire-resistive construction.
    - "3) Alternate materials and methods, such as installing a draft hydrant in lieu of fire-resistive construction, may be considered by the Building Department in accordance with Section R104.11 in its discretion on a case-by-case basis.

Floodplain Regulations and NFIP Participation

There are no Special Flood Hazard Areas identified in the most current (November 2018) Flood Insurance Study and associated National Flood Hazard Layer. Thus, the Town is not a participant in the National Flood Insurance Program and is not required to. There are no repetitive loss properties. Although the Town does not have a floodplain ordinance in place, it addresses development in flood prone areas in its subdivision regulations (noted previously). Proposed subdivisions impacting a flood-prone area must be designed to minimize flood damage within the flood-prone area; must locate and construct all public

utilities and facilities, such as sewer, gas, electric and water systems, to minimize and eliminate flood damage; and must provide adequate drainage to reduce exposure to flood hazards.

D.4.2 Administrative/Technical Mitigation Capabilities

D-13 identifies the personnel responsible for activities related to mitigation and loss prevention in Dillon.

Table D-13 Dillon—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with Knowledge of Land Development/Land Management Practices	Yes	Planning/Engineering Department	
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	Yes	Planning/Engineering Department	
Planner/Engineer/Scientist with an Understanding of Natural Hazards	Yes	Planning/Engineering Department	
Personnel Skilled in GIS	Yes	Planning/Engineering Department	
Full Time Building Official	No	Summit County Building Department	Contract
Floodplain Manager	No		
Emergency Manager	No	Summit County Emergency Manager	
Grant Writer	No		
Other Personnel	No		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Planning/Engineering Department	
Warning Systems/Services (Reverse 9-11, Cable Override, Outdoor Warning Signals)	Yes	Through Summit County Communications Center	
Other	Yes		Level 1 Inspector of Commercial Vehicles; Mountain Pine Beetle Program

D.4.3 Fiscal Mitigation Capabilities

Table D-14 identifies financial tools or resources that Dillon could potentially use to help fund mitigation activities.

Table D-14 Dillon—Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project Funding	Yes	
Authority to Levy Taxes for Specific Purposes	Yes	With vote
Fees for Water, Sewer, Gas, or Electric Services	Yes	Water and sewer fees
Impact Fees for New Development	Yes	Water, sewer, and housing
Incur Debt through General Obligation Bonds	Yes	With vote
Incur Debt through Special Tax Bonds	Yes	With vote
Incur Debt through Private Activities	No	
Withhold Spending in Hazard Prone Areas	No	

D.4.4 Mitigation Outreach and Partnerships

- Each spring, the governments of Summit County, Breckenridge, Dillon, Frisco and Silverthorne distribute a packet of information to inform the communities about how to prepare for possible high water in May and/or June resulting from snowmelt.
- The Dillon Town Council and Dillon Water Department request water conservation from citizens and businesses on a voluntary basis by eliminating the use of sprinklers and irrigation systems from 9 am to 6 pm every day.
- For many years, the Town has been working to control the spread of the Mountain Pine Beetle. Town crews have been conducting surveys on both public and private property and have been removing infested trees in an effort to protect our valuable community forests.
- The Town is engaged in an ongoing water conservation program, as well as Firewise educational efforts in association with the Summit County Wildfire Council.

D.4.5 Past Mitigation Efforts

Working with Summit County and Denver Water, the Town took the lead on Wildland Urban Interface hazardous fuels reduction in the Town limits area of Summit County, Denver Water, and Town property (in and around the Dillon Cemetery) over the past five (5) years (2015-2019).

D.4.6 Opportunities for Enhancement

Based on the capability assessment, Dillon has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the Town to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM. Additional training opportunities will help to inform Town staff and board members on how best to integrate hazard information and mitigation projects into the Town policies and ongoing duties of the Town. Continuing to train Town staff on mitigation and the hazards that pose a risk to the Town will lead to more informed staff members who can better communicate this information to the public.

D.5 Mitigation Goals and Objectives

Dillon adopted the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

D.6 Mitigation Actions

The planning team for Dillon identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: Dillon—1 Local Mitigation Planning Committee

Jurisdiction:	Town of Dillon
Action Title:	Develop a Hazard Mitigation Planning Committee to guide policy and implementation
Hazard(s) Mitigated	Multi-Hazard
Priority:	Low
Issue/Background:	The organization (TOD) is changing and this reference would be updated annually to ensure proper use of resources throughout the year.
Ideas for Implementation:	Town department heads meet on a regular basis and this reference would be updated on the first meeting date in January of each year. Upon approval from the department heads, the reference could be presented to the Town Manager.
Responsible Agency:	Town of Dillon Department heads
Partners:	All towns and Summit County Special districts Summit County Office of Emergency Management
Potential Funding:	None needed for committee personnel.
Cost Estimate:	No cost for the committee; costs determined by hazard.
Benefits: (Losses Avoided)	• Implements mitigation plan • Improves communication and coordination • Reduces risk when projects are implemented
Timeline:	Ongoing
Status:	Ongoing as of 2020. The reference will be drafted into a working document and set for review by the department heads as referenced above.

Mitigation Action: Dillon—2 Public Involvement

Jurisdiction:	Town of Dillon
Action Title:	Improve education on risk and preparedness and mitigation measures
Hazard(s) Mitigated	Multi-Hazard
Priority:	Low
Issue/Background:	There is a need for continued and improved education on hazard preparedness and mitigation measures that are available to the public.
Ideas for Implementation:	Educational information related to hazard preparedness and mitigation will be added to the Town's websites. The Town will be creating systems to ensure public information leading up to, during and after emergencies is available in a timely manner, through Town social media, Town operated digital signs, Town websites, and email lists/groups that subscribe to Town information. As part of this the Town will create procedures to ensure the information available to the public is updated regularly, and in a timely manner in the event of an actual emergency. The Town of Dillon will coordinate with Summit County and other towns in these efforts to ensure the information provided is the most current information available to the public.
Responsible Agency:	Town of Dillon Police Department
Partners:	All towns and Summit County Special districts Summit County Office of Emergency Management
Potential Funding:	None needed
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Educating the public about hazard mitigation greatly reduces the potential losses in cases of emergency situations / disasters.
Timeline:	Ongoing
Status:	Ongoing as of 2020. The outreach program will be initiated through updating Town operated digital media. Digital signage is already in place and personnel costs can be minimized since most of the plan can be accomplished by incorporating this into regularly scheduled meetings.

Mitigation Action: Dillon—3 Multi-hazard awareness and warning system

Jurisdiction:	Town of Dillon
Action Title:	Multi-hazard awareness and warning system
Hazard(s) Mitigated	Multi-Hazard including wildfire, severe winter weather, hazardous materials, dam incident
Priority:	Medium
Issue/Background:	The Town will implement a multi-hazard awareness and warning system. A key component of this system includes purchasing two (2) variable messaging boards/signs that can be mobilized and placed in areas to provide information and direction to people as they drive/move throughout the Town and County. For example, these signs will be utilized to provide messaging to people during "burn bans", mitigating the potential of a human caused fire during high fire danger. The signs can also communicate safe areas or routes to avoid in the event of closures to mitigate public safety issues with wildfires, dam incidents, severe winter weather, hazardous materials incidents etc.
Ideas for Implementation:	
Responsible Agency:	Dillon Police Department
Partners:	Summit County, CDOT, CDPS
Potential Funding:	Staff time/Dept. Budget
Cost Estimate:	$15,000.00 per unit: total $30,000,00
Benefits: (Losses Avoided)	The community and visitors will benefit with clear direction and information that can be displayed on site to educate the public before a potential hazard event.
Timeline:	One (1) year.
Status:	New in 2019

D.7 Implementation and Maintenance

Moving forward, the Town will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

D.7.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Town to help inform updates and the development of local plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

The risk and vulnerability information the 2013 Summit County Hazard Mitigation Plan and the Town of Dillon annex was used to inform the 2017 update to the Town of Dillon Comprehensive Plan, as noted in section D.4 Capability Assessment. The plan acknowledges that as the Town continues to grow and develop, "…the potential for development to conflict with areas with natural hazards increases" (Dillon, 2017). Refer to subsection D.4.1 Regulatory Mitigation Capabilities for more information related to the integration and acknowledgment of the hazards in the Town's Comprehensive Plan.

Process Moving Forward

Moving forward, the Public Works Department may utilize the hazard information when updating the Town's Capital Improvement Plan annually and the Planning and Development Department may utilize the hazard information when reviewing a site plan or other type of development applications. The Town will also incorporate this HMP into future updates to the Town of Dillon Comprehensive Plan as well as other master planning documents.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Dillon will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting

D.7.2 Monitoring, Evaluation and Updating the Plan

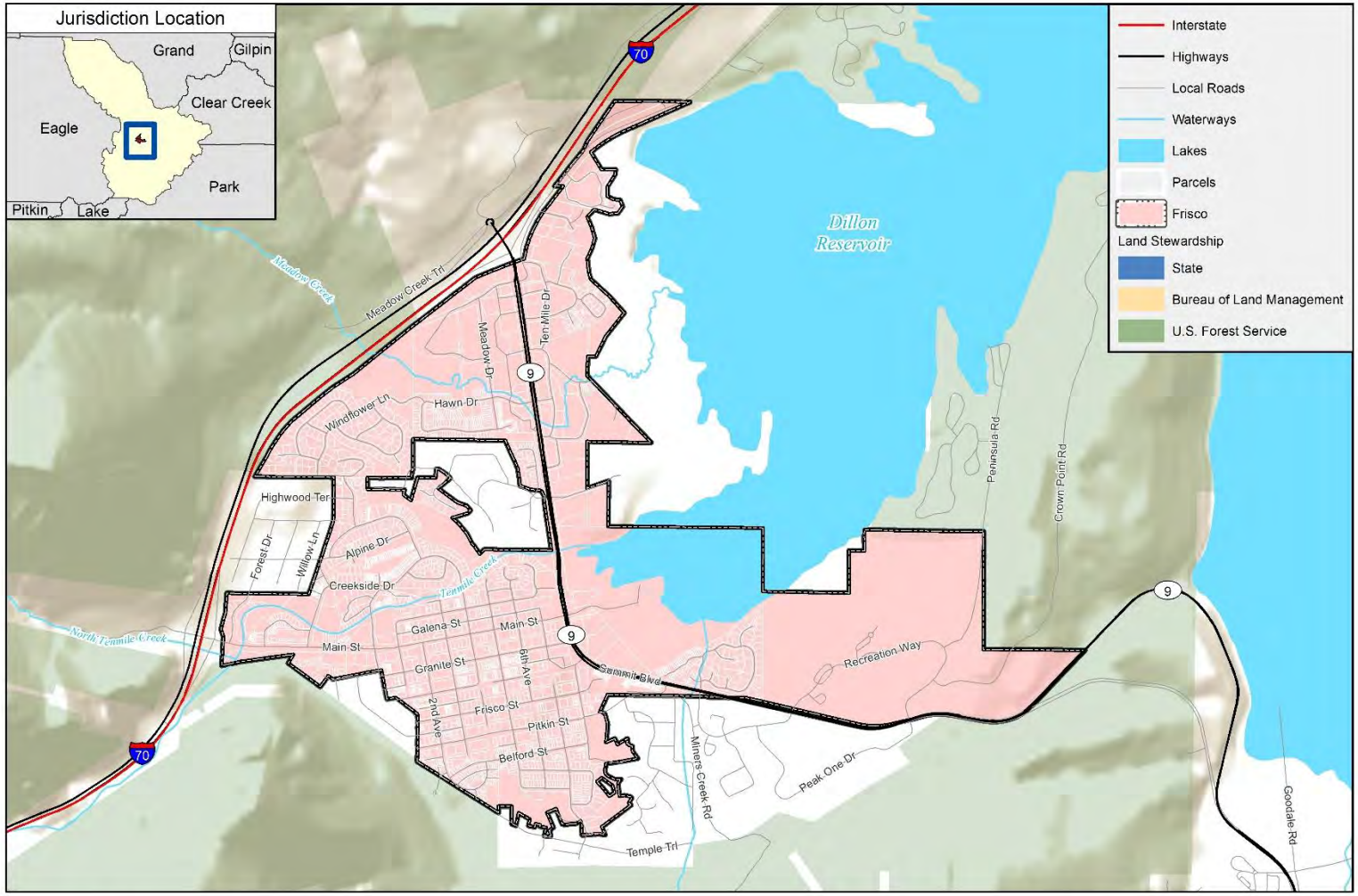
The Town will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The Town will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The Dillon Police Chief will be responsible for representing the Town in the County HMPC, and for coordination with Town staff and departments during plan updates. The Town realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

ANNEX E: TOWN OF FRISCO

E.1 Community Profile

Figure E-1 shows a map of the Town of Frisco and its location within Summit County.

Figure E-1 Map of Frisco



E.1.1 Geography

The Town of Frisco is located in central Summit County on the west shores of Dillon Reservoir and east of the base of Royal Mountain. Ten Mile Creek runs in an easterly direction through the city. The Town's total area is 1.8 square miles and the nearest city is Silverthorne, approximately five miles east along Interstate 70. The elevation at Frisco is 9,075 feet, and the climate is typified by cold winters and temperate summers. Native vegetation consists of sparse subalpine forest and dispersed patches of evergreen shrubs.

E.1.2 Population

The estimated 2017 population of the Town of Frisco was 2,977, which is a 10.9% increase since 2012. Select U.S. Census American Community Survey (ACS) demographic and social characteristics for Frisco are shown in the following tables and figures.

Table E-1 Frisco Demographic and Social Characteristics 2012-2017

Frisco	2012	2017	% Change
Population	2,684	2,977	10.9%
Median Age	34.8	48.1	38.2%
Total Housing Units	3,030	3,505	15.7%
Housing Occupancy Rate	36.8%	33.8%	-8.2%
% of Housing Units with no Vehicles Available	1.3%	0.0%	-100.0%
Median Home Value	$486,200	$577,000	18.7%
Unemployment	6.0%	0.0%	-100.0%
Mean Travel Time to Work (minutes)	16.8	9.9	-41.1%
Median Household Income	$73,981	$67,938.00	-8.2%
Per Capita Income	$37,607	$33,173	-11.8%
% Without Health Insurance	19.0%	12.8%	-32.6%
% of Individuals Below Poverty Level	10.9%	2.7%	-75.2%
# of Households	1,116	1,183	6.0%
Average Household Size	2.4	2.52	5.0%
% of Population Over 25 with High School Diploma	95.5%	98.6%	3.2%
% of Population Over 25 with bachelor's degree or Higher	54.5%	50.3%	-7.7%
% with Disability	2.8%	15.8%	464.3%
% Speak English less than "Very Well"	3.3%	4.8%	45.5%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table E-2 Demographic and Social Characteristics Compared to the County and State

Demographic & Social Characteristics (as of 2017)	Frisco	County	Colorado
Median Age	48.1	39.2	36.5
Housing Occupancy Rate	33.8%	30.80%	89.80%
% of Housing Units with no Vehicles Available	0.0%	1.60%	5.30%
Median Home Value	$577,000	$547,700	$286,100
Unemployment	0.0%	2.60%	5.20%
Mean Travel Time to Work (minutes)	9.9	16.4	25.2
Median Household Income	$67,938	$73,538	$65,458
Per Capita Income	$33,173	$37,192	$38,845
% Without Health Insurance	12.8%	21.40%	9.40%
% of Individuals Below Poverty Level	2.7%	10.30%	11.50%
Average Household Size	2.52	3.1	2.55
% of Population Over 25 with High School Diploma	98.6%	93.40%	91.10%
% of Population Over 25 with bachelor's degree or Higher	50.3%	47.80%	39.40%
% with Disability	15.8%	6.10%	10.60%
% Speak English less than "Very Well"	4.8%	7.50%	6.00%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table E-3 Demographics by Race and Sex

Frisco	Population	%
Total Population	2,977	
Male	1,498	50.3%
Female	1,479	49.7%
White, not Hispanic	2,608	87.6%
Hispanic or Latino	112	3.8%
Black	0	0.0%
Asian	51	1.7%
American Indian and Alaska Native	203	6.8%
Native Hawaiian and Other Pacific Islander	0	0.0%
Some other race	42	1.4%
Two or more races	206	6.9%

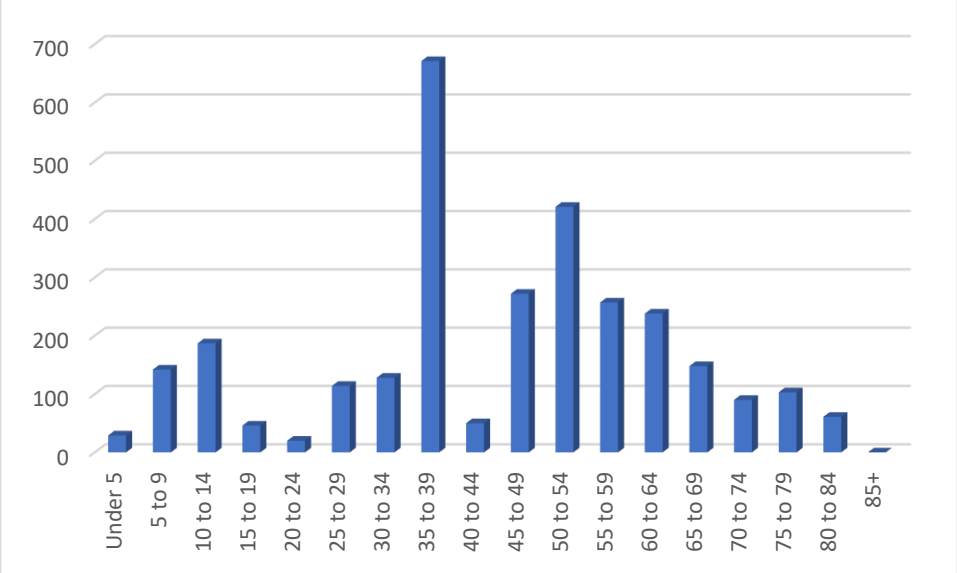
Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Table E-4 Types and Total Amounts of Housing Units in Frisco

Type of housing units	Total	Percentage
Total housing units	3,505	
1-unit detached	498	14.2%
1-unit attached	788	22.5%
2 units	107	3.1%
3 or 4 units	393	11.2%
5 to 9 units	697	19.9%
10 to 19 units	440	12.6%
20 or more units	582	16.6%
Mobile home	0	0.0%
Boat, RV, van, etc.	0	0.0%

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Figure E-2 Age Distribution in Frisco



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

E.1.3 History

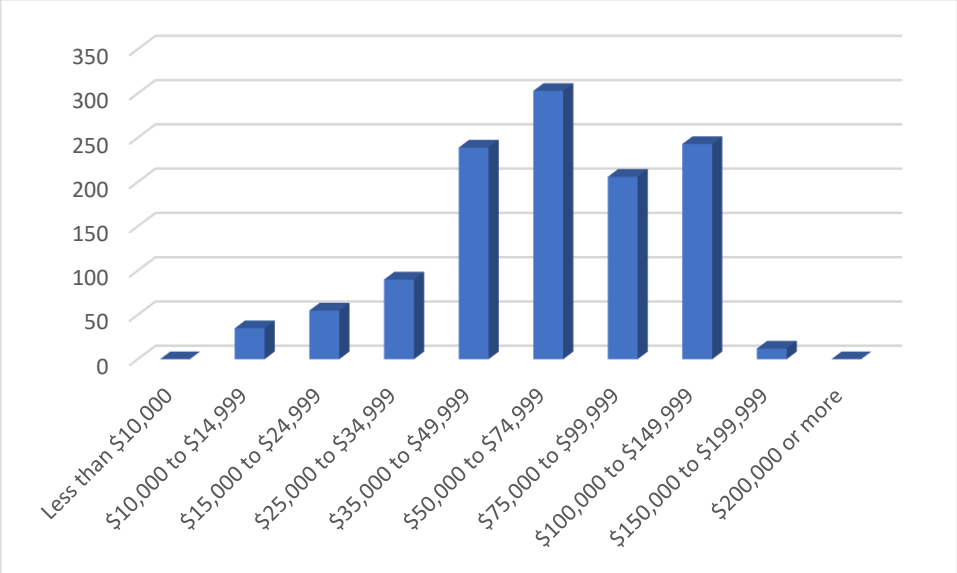
The Town of Frisco was incorporated in 1880, and its early history was shaped by the mining industry. A stagecoach and two major railroad routes converged at the Town making it a gateway to the mining claims located near the crest of the Continental Divide. Skiing also has been a part of the Town's history going back at least 120 years. Much of Frisco's history is preserved within the Frisco Historical Park, including restored nineteenth century log cabins, a chapel, and a jailhouse.

E.1.4 Economy

According to 2017 Census Bureau estimates, the industries that employed the highest percentages of Frisco's labor force were retail trade (23.0%); other services, except public administration (21.9%); educational services, and health care and social assistance (13.3%); and arts, entertainment, recreation, accommodation, and food services (10.1%).

As shown in Table E-2, per capita income in Frisco was $33,173 in 2017, which is roughly 11% and 15% below average for Summit County and the State of Colorado respectively. A breakdown of Frisco's income distribution is shown in Figure E-3.

Figure E-3 Income Distribution in Frisco



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

E.2 Hazard Identification and Profiles

Frisco's HMPC identified the hazards that affect the community and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and planning significance specific to the Town (see Table E-5). In the context of the countywide planning area, there are no hazards that are unique to Frisco.

Table E-5 Frisco—Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Isolated	Unlikely	Limited	Low
Drought	Large	Likely	Limited	Medium
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Medium	Likely	Limited	Medium
Flood	Isolated	Likely	Limited	Medium
Hazardous Materials Release (Transportation)	Isolated	Occasional	Critical	High
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Unlikely	Limited	Low
Lightning	Large	Likely	Critical	Medium
Pest Infestation (Forest and Aquatic)	Small	Highly Likely	Limited	High
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Small	Occasional	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

E.3 Vulnerability Assessment

The intent of this section is to assess Frisco's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk to hazards for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan document.

E.3.1 Community Asset Inventory

Table E-6 shows the total number of improved parcels, properties, and their improvement and content values for the Town of Frisco. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, 150% for Utility structures, 100% for Commercial structures, and 0% for Exempt and Vacant parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table E-6 Frisco Improved Parcel and Property Exposure

Parcel Type	Parcel Totals	Total Properties*	Improved Value	Content Value	Total Value
Commercial	80	301	$153,527,267	$153,527,267	$307,054,534
Exempt	199	297	$0	--	$0
Residential	1,567	3,188	$1,738,756,230	$869,378,115	$2,608,134,345
Utilities	1	1	$428,966	$643,449	$1,072,415
Vacant	2	6	$5,950,824	--	$5,950,824
TOTAL	**1,849**	**3,793**	**$1,898,663,287**	**$1,023,548,831**	**$2,922,212,118**

Source: Summit County Assessors Data, November 2019.

*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table E-7 lists summary information about the 13 critical facilities and other community assets identified by Frisco's HMPC as important to protect or provide critical services in the event of a disaster. Table E-8 details more information on the critical facilities in question found in the town and considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, to estimate whether it might be at risk of the various hazards assessed. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the base plan HIRA (Chapter 3).

Table E-7 Frisco Critical Facilities

FEMA Lifeline	Critical Facility Type	Total
Communications	Information Centers	1
Energy	Energy Substations	1
Food/Water/Shelter	Wastewater Facilities	1
Hazardous Materials	HazMat Tier II SARA Facilities	2
Other/Schools	Schools	1
Safety and Security	Fire Lookout Locations	1
	Fire Station	1
	Government Buildings	4
	Police Stations	1
	TOTAL	13

Source: Summit County GIS, Summit County HMPC.

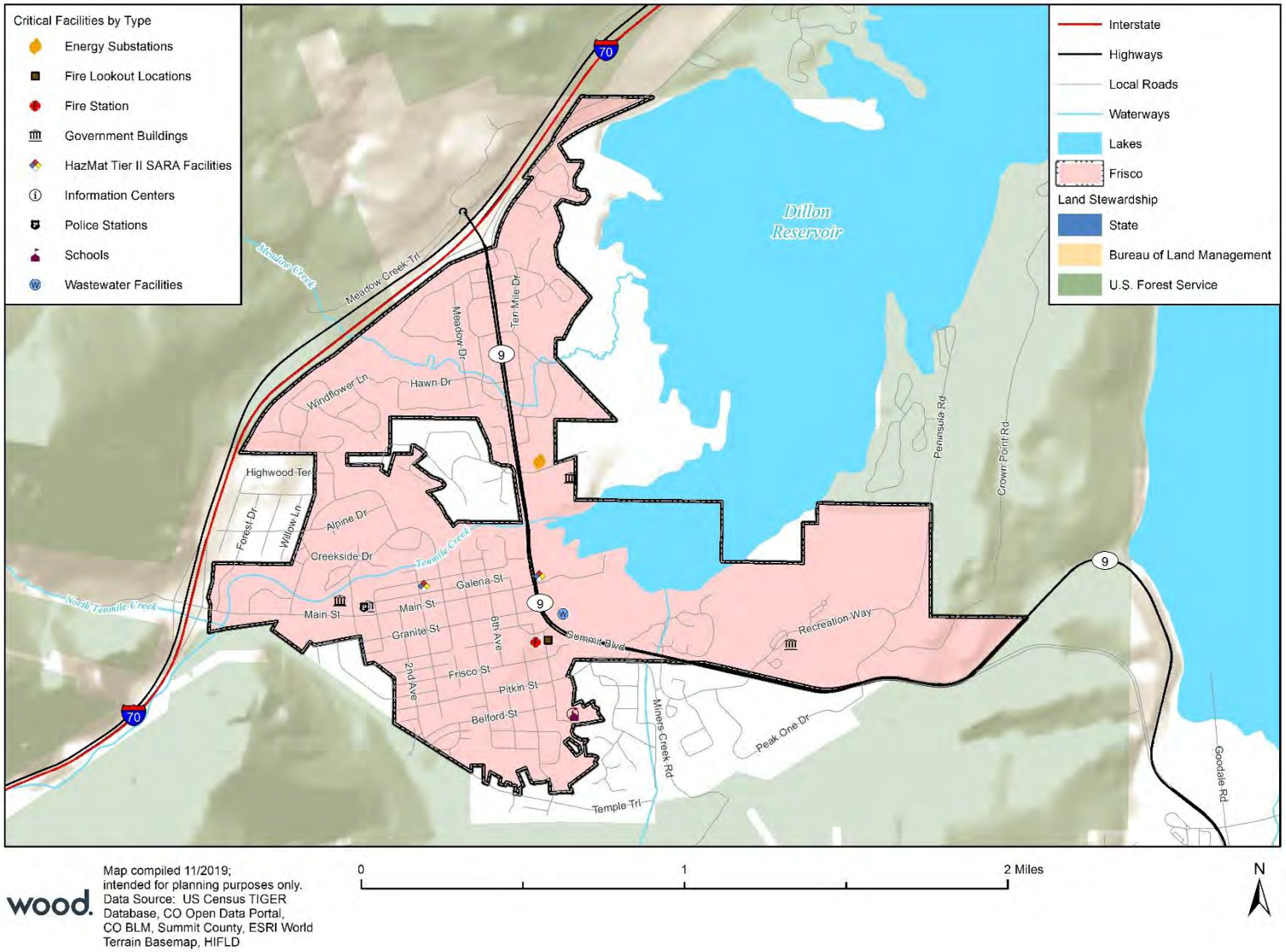
Table E-8 Detailed List of Critical Facilities and Infrastructure in Frisco

FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location
Communications	Information Centers	Frisco Elementary Information Center	S 8th Ave and Hwy 9
Energy	Energy Substations	Xcel Energy Facility	39 School Rd (Town of Frisco)
Food/Water/Shelter	Wastewater Facilities	Frisco Wastewater Treatment Plant (HEM)	
Hazardous Materials	HazMat Tier II SARA Facilities	CenturyLink Communications - Frisco Central Office	302 Galena St, Frisco 80443
Hazardous Materials	HazMat Tier II SARA Facilities	Ferrellgas	105 Summit Dr, Frisco 80443
Other/Schools	Schools	Frisco Elementary School	
Other/Schools	Schools	Summit County Preschool	
Safety and Security	Fire Lookout Locations		
	Fire Station	Summit Fire Station 2	301 S. 8th Ave, Frisco 80443
	Government Buildings	Frisco Public Works	
		USPS Frisco	
		Frisco Rec Peninsula Day Lodge	
		Frisco Town Hall	
	Police Stations	Frisco Police Department	1 E Main St, Frisco 80443

Source: Summit County GIS, Summit County HMPC.

The locations of critical facilities in Frisco identified by Summit County GIS are illustrated in Figure E-5.

Figure E-4 Critical Facilities and Infrastructure in the Town of Frisco



E.3.2 Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan.

- Dam Failure
- Drought
- Earthquake
- Landslide, Mudflow/Debris Flow, Rockfall
- Lightning
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Only Flood and Wildfire hazards will be profiled in the following vulnerability assessment sections, due to the ability to quantify vulnerability further with available data. While dam failure inundation maps were not available for the dams upstream of Frisco on Tenmile Creek, there is likely some exposure to potential failures of tailing storage facilities (Ten Pond #3 Dam, Bufferhs Dam) or the Clinton Gulch Dam. These dams are described further in Section 3.3.3 under the Base Plan HIRA.

Flood

The main flood-causing streams in Frisco include Ten Mile Creek, Meadow Creek, and Miners Creek. Ten Mile Creek flows easterly through Frisco and discharges into Dillon Reservoir. It drains approximately 94 square miles, all within Summit County. Vegetation along the channel through Frisco consists of sparse woods and scattered brush. The channel bed is mostly cobble materials with interspersed boulders. Meadow Creek also flows easterly through Frisco into Dillon Reservoir. The basin has a total drainage area of 5.8 square miles and a length of 4.5 miles. In Frisco, Meadow Creek is confined mainly to a constructed channel through residential and commercial areas (FEMA, 1994 and 2011).

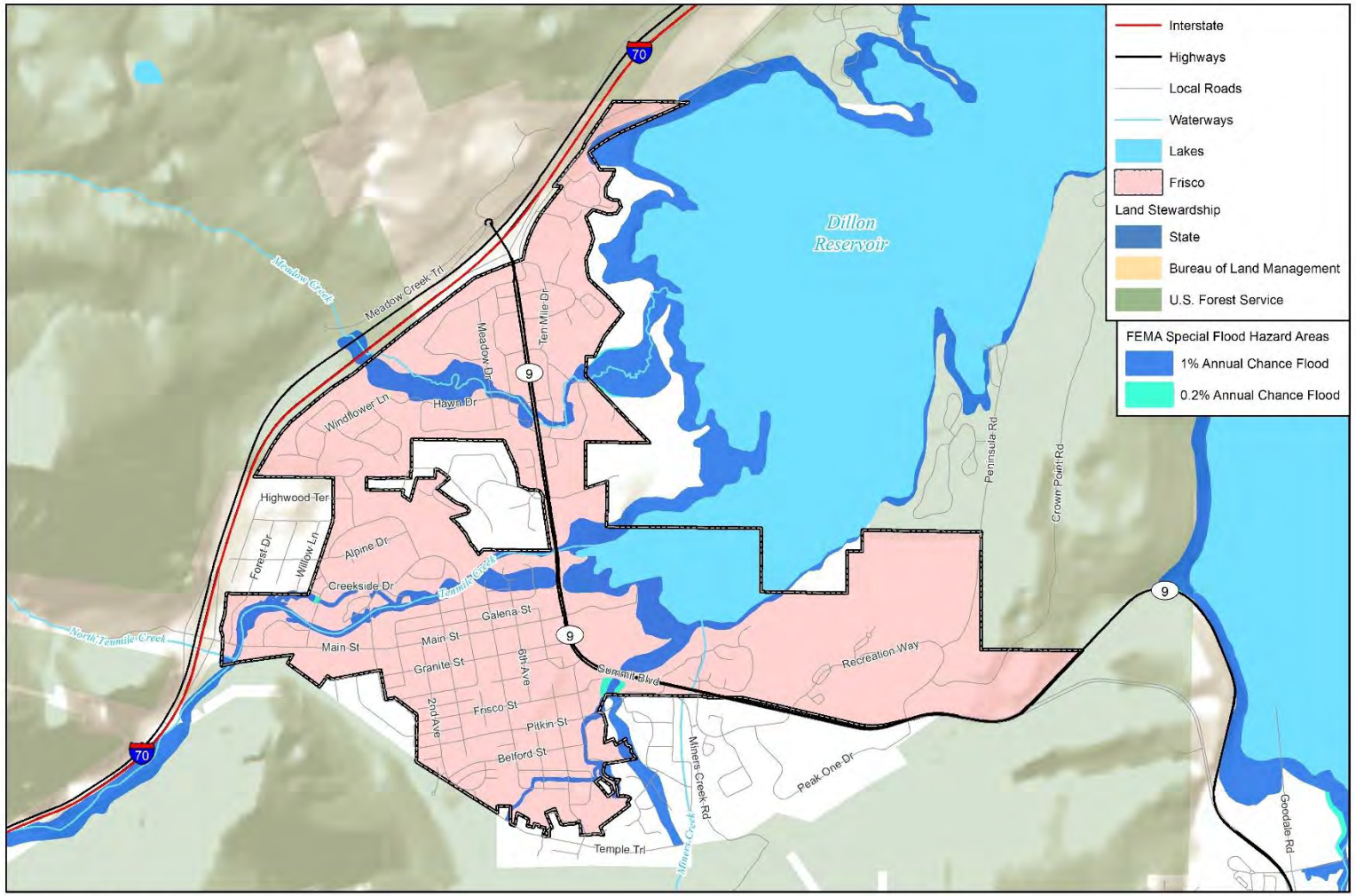
The principal flood problems along Ten Mile and Meadow Creeks from May through September are a result of snowmelt and/or intense rainstorms. Flows approximately equaling the 100-year flood were recorded on June 16, 1965, along Ten Mile Creek but no records of damages are available. Drainage complications from freeze-thaw cycles have also contributed to flooding when the ground is still frozen and cannot absorb excess water, usually from melting snow. The flooding results from repeated melting and freezing of accumulated snow draining into low lying areas. There are no flood protection structures in place that reduce flood hazards in Frisco (FEMA, 2018).

Floodplain development in Frisco consists primarily of condominium and townhome buildings along with single family residences along Ten Mile Creek. Additionally, there are several condominium developments in the floodplain along Meadow Creek.

General Property

Vulnerability to flooding was determined by summing potential losses to Summit County's properties in GIS, by using the latest FEMA NFHL data along with the Summit County parcel layer the provided by the Assessor's Office. FEMA's NFHL data depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events. This latest NFHL data is current as of September 17, 2019. Figure E-5 below displays the FEMA special flood hazard areas present in the town, color coded based on flood event (i.e. 100-year versus 500-year).

Figure E-5 FEMA Special Flood Hazard Areas in Frisco



Map compiled 12/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, FEMA NFHL

Based on the GIS analysis performed with the county parcel layer and the available FEMA flood mapping, the potential flood risk for the Town is shown in Table E-9. Frisco's 1% annual chance flood zone has 83 properties and an estimated $62.4M in total value exposed. Most properties at risk of flooding from both 1% and 0.2% annual chance flood events are residential in nature.

Table E-9 Summary of Frisco Properties Vulnerable to Flood, by Property Type

Flood Event	Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population
100-year	Commercial	3	$1,331,159	$1,331,159	$2,662,318	$665,580	--
	Exempt	8	$0	--	$0	$0	--
	Residential	72	$39,803,808	$19,901,904	$59,705,712	$14,926,428	223
TOTAL		**83**	**$41,134,967**	**$21,233,063**	**$62,368,030**	**$15,592,008**	**223**
500-year	Residential	4	$1,485,274	$742,637	$2,227,911	$556,978	12
TOTAL		**4**	**$1,485,274**	**$742,637**	**$2,227,911**	**$556,978**	**12**
GRAND TOTAL		**87**	**$42,620,241**	**$21,975,700**	**$64,595,941**	**$16,148,985**	**236**

Source: Summit County, FEMA NFHL, U.S. Census Bureau, Wood analysis

Flood Insurance Policy Analysis

NFIP insurance data indicates that as of September 12, 2019, there were 224 flood insurance policies in force in Frisco, with $50,108,100 of coverage. This is an increase of 72 policies since 2013. A total of 90 policies currently fall in A01-30 & AE zones, and 134 were located outside of the Special Flood Hazard Areas (i.e. zones B, C & X). There have been two historical claims for flood losses totaling $921. There were no repetitive or severe repetitive loss properties as defined by the NFIP.

People

The population exposed to the flood hazards described in the flood vulnerability analysis above was estimated by applying an average household size factor (based on 2018 U.S, Census estimates for Summit County, which equal to 3.1 persons per household) to the number of improved residential properties identified in the flood hazard areas within Frisco. These estimates yielded the population exposures shown in the table above (Table E-9). As such, the combined 1% and 0.2% annual chance floods would potentially displace 236 people, based on the residential structures which fall in those flood zones. For additional details on potential displacements by flood event, see the Summit County base plan HIRA (Chapter 3) document.

Critical Facilities and Infrastructure

No critical facilities were found to overlap with the flood zones mapped for Frisco. This does not necessarily mean that no critical facilities are at risk of flooding, as localized flash flooding or non-mapped flooding is still possible outside of the studied stream areas.

Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, and other downtime costs. Flooding often coincides with the busy summer tourism months in Summit County, and may impact, directly or indirectly (such as from the negative perception of potential danger to his hazard), the revenues of shops, restaurants, hotels, and other major industries which keep the local economy thriving. In addition, major flooding which led to road or other

infrastructure closures could additionally limit access to the Town by tourists, locals, and even basic goods and services.

Historical, Cultural, and Natural Resources

The environment is mostly resilient to general flooding. However, cultural or historic properties within floodplains would be affected in similar ways as property and critical facilities/infrastructure, especially those with underground or basement levels where water would easily seep and potential ruin archives, resources, or other important assets.

While two historical/cultural properties of interest are located in Frisco based on the National Register of Historic Places (the Frisco Schoolhouse and the Wildhack's Grocery Store-Post Office), neither is found to overlap with currently mapped FEMA special flood hazard areas.

Future Development

The Flood Hazard Area regulations in the Frisco Town Code regulate development in mapped special flood hazard areas. Subdivision regulations also seek to prevent flood damage to persons and properties and minimize expenditures for flood control and to restrict building on floodlands, shorelands, steep slopes, areas covered by poor soils, or in areas otherwise poorly suited for building or construction.

Hazardous Materials Release

The only Tier II hazardous materials facilities within Frisco town limits are the CenturyLink Communications Center and the Ferrellgas location, as shown in Table 3-11 in the base plan. Both I-70 and U.S. 6 are significant hazardous materials transportation routes.

Wildfire

General Property

Wildfire threat was estimated from Summit County's Wildfire Protection Assessment Rating layer, which classifies areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in Frisco. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. From the improvement values were. Property improvements and estimated content values were then totaled to arrive at the Total Value column, which is also the estimated potential loss as wildfires typically result in complete loss to structure and contents. Frisco is primarily found in Low and Medium hazard areas.

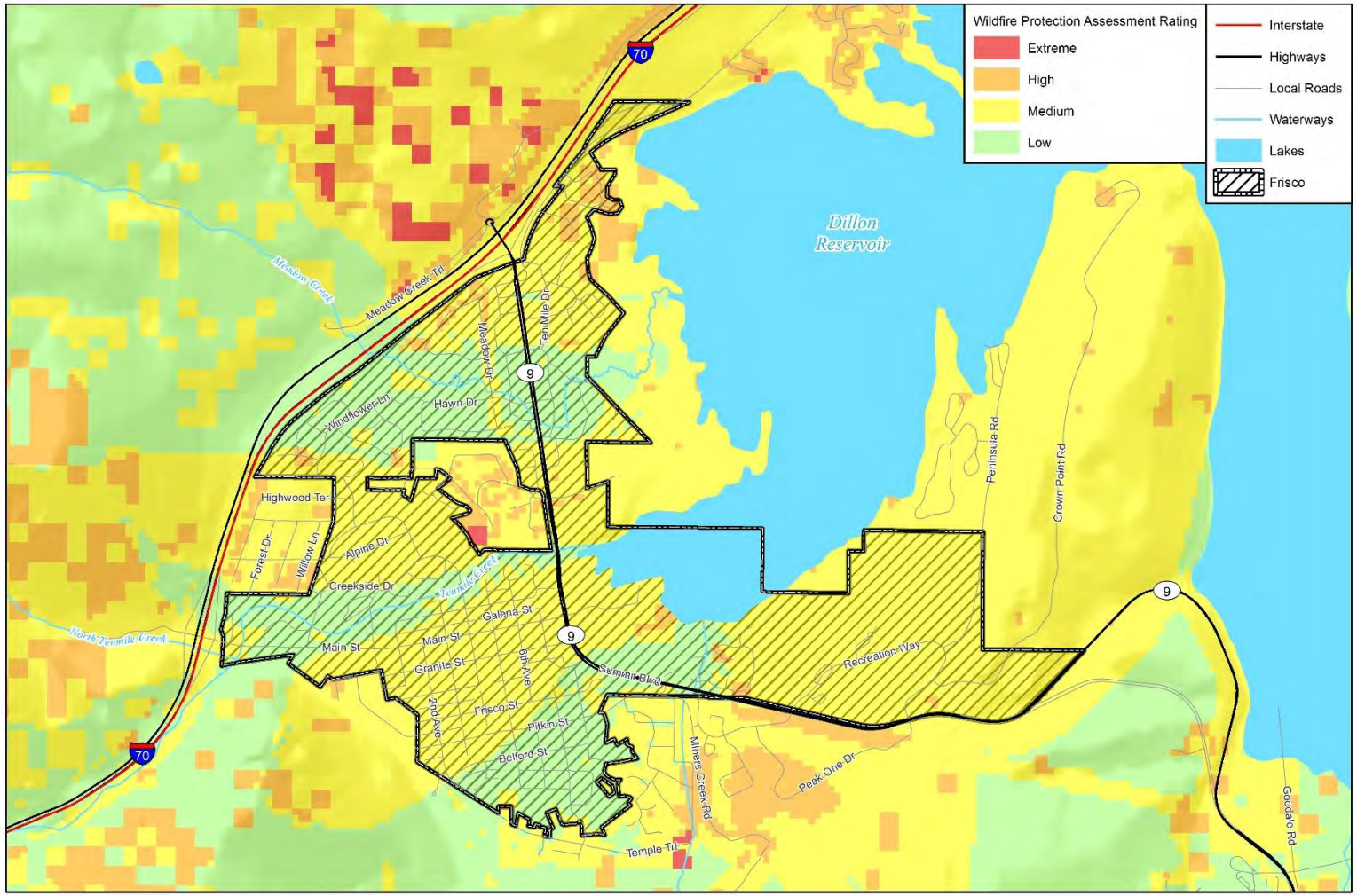
Wildfire protection assessment areas for Frisco are displayed in Figure E-6 for reference.

Table E-10 Property Values in Wildfire Zones by Parcel Type, Frisco

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Commercial	262	$119,830,887	$119,830,887	$239,661,774	-
Exempt	23	$0	--	$0	--
Residential	1,933	$1,071,545,081	$535,772,541	$1,607,317,622	5,992
Utilities	1	$428,966	$643,449	$1,072,415	--
Vacant	4	$5,408,460	--	$5,408,460	--
TOTAL	**2,223**	**$1,197,213,394**	**$656,246,877**	**$1,853,460,271**	**5,992**

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis

Figure E-6 Wildfire Threat and Critical Facilities in Frisco



People

The last column of Table E-10 above summarizes the number of potential people at risk to wildfire in the analyzed fire zones (medium and high rated protection assessment areas). Based on the assessment conducted, Frisco has an estimated 5,992 people at risk of rated wildfire zones. These totals were estimated by multiplying the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire threat zone/s. The numbers may not be fully accurate but provide a general estimate of potential people exposed to wildfire risks in the area.

In addition, smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

There are 8 critical facilities found in wildfire assessment areas in Frisco, as listed below. They all fall in the Medium rated wildfire category based on assessed hazard threat.

Table E-11 Critical Facilities in Frisco in Wildfire Protection Assessment Areas

FEMA Lifeline Category	Critical Facility Type	Total Critical Facilities
Energy	Energy Substations	1
Food/Water/Shelter	Wastewater Facilities	1
Hazardous Materials	HazMat Tier II SARA Facilities	2
Safety and Security	Government Buildings	3
	Police Stations	1
TOTAL		8

Source: Summit County, HIFLD, CO-WRAP, Wood Analysis

Summit Fire and EMS (SFE), which provides fire protection services to the Town of Frisco and surrounding area, is considered an initial attack center for wildland fires on all private land and takes a joint responsibility with the U.S. Forest Service for fires on federal land. Refer to Annex I Fire Protection Districts for additional information on SFE.

Economy

Tourism, the accommodation and food services industry (e.g. hotels and restaurants), and retail are major components of Summit County's economy, and Frisco's as well. Wildland fires can, for example, lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation, stays in hotels, spending on restaurants and other commerce sources, and more.

Historical, Cultural, and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after the fire.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important historical assets in Frisco. Two historical/cultural properties of interest are located in Frisco based on the National Register of Historic Places: the Frisco Schoolhouse and the Wildhack's Grocery Store-Post Office. Both are found to overlap with Medium rated wildfire protection assessment areas.

Future Development

Frisco does not have any policies or regulations in place to address new development in the wildland-urban interface.

E.3.3 Growth and Development Trends

Table E-12 illustrates how Frisco has grown in terms of population and number of housing units between 2013 and 2017.

Table E-12 Frisco—Change in Population and Housing Units, 2012-2017

2012 Population	2017 Population Estimate	Estimated Percent Change 2012-2017	2012 # of Housing Units	2017 Estimated # of Housing Units	Estimated Percent Change 2012-2017
2,684	2,977	+10.9	3,030	3,505	+15.7

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates, 2013-2017

Because Frisco is essentially landlocked due to topography, the primary source of new growth is occurring as a result of the redevelopment and infill development of existing residential and commercial properties and lots.

E.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

E.4.1 Regulatory Mitigation Capabilities

Table E-13 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Frisco.

Table E-13 Frisco—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	Town of Frisco Community Plan, updated every 5 years, last updated 2019
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Growth Management Ordinance	Yes	
Floodplain Ordinance	Yes	
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	Yes	
Building Code	Yes	2018 International Building Code
Fire Department ISO Rating	Yes	Rating: 4
Erosion or Sediment Control Program	Yes	
Stormwater Management Program	Yes	
Site Plan Review Requirements	Yes	
Capital Improvements Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	Frisco Local Emergency Operations Plan, 2005
Flood Insurance Study or Other Engineering Study for Streams	Yes	FEMA Flood Insurance Study for Summit County and Incorporated Areas, November 16, 2018
Elevation Certificates	Yes	
Other	Yes	Community Rating System: 8

The Town of Frisco's application submittal requirements for site plan reviews are cited as a best practice in the document *Planning for Hazards: Land Use Solutions for Colorado* created by the Colorado Department of Local Affairs.

Town of Frisco Community Plan 2019

The Frisco Community Plan is an advisory document that presents a clear and concise community vision for the future of Frisco, and establishes realistic strategies for achieving that vision. The plan is visionary and not regulatory, and is intended to provide direction to elected officials, appointed officials, staff, and the citizenry. The 2019 Plan establishes six guiding principles and highlights the County's 2013 Hazard Mitigation Plan. Guiding Principle 6: Sustainable Environment states the following:

> Frisco's natural environment is the primary quality that attracts residents and visitors. It supports our economy and drives our recreational pursuits. Protecting the surrounding mountains, forests, waterways, and views are all deeply important to the community. These natural assets make Frisco beautiful, unique, and drive a thriving year-round economy. **Pollution, wildfires, avalanches, and floods are threats to Town resources that should be recognized and minimized to the extent possible.** The community should embrace measures for sustainability that reduce greenhouse gas emissions and conserve its water resources.

The following goal and policies under Guiding Principle 6 relate to natural hazards and hazard mitigation:

- **Goal 6.3:** Minimize risks to property, infrastructure and lives from natural disasters.

- 6.3A Continue to collaborate with regional partners on efforts to implement the Community Wildfire Protection Plan (CWPP), Summit County All-Hazards Mitigation Plan, and standardized emergency response plans.
- 6.3B Educate property owners on the impacts of development in areas that are susceptible to risk from natural hazards.
- 6.3C Evaluate Town policies and regulations to support best practices in hazard resiliency.

Town of Frisco Town Code

The Frisco Town Code serves as the legal framework for the Town, codifying allowable activities, and creating an enforcement structure for the adopted policy of the Town. Outlined below are the chapters in the Frisco Town Code that are related to hazard mitigation and loss avoidance:

- **Chapter 97 Flood Hazard Areas:** The purpose of the floodplain ordinance is to protect public health, safety, and welfare by regulating development and land use in mapped flood hazard areas.
- **Chapter 180 Unified Development Code (Subdivision of Land):** The subdivision regulations require that particular consideration will be given to geologic hazards and topography in relation to the suitability of the land for development, flooding, storm drainage, and preservation of natural areas for open space. Land subject to hazardous conditions such as landslides, mudflow, rock falls, snowdrifts, possible mine subsidence, shallow water table, floods, and polluted or nonpotable water supply shall be identified and shall not be subdivided until hazards have been or will be eliminated by the subdivider in accordance with the plans developed by a Colorado licensed engineer specializing in such matters, and as approved by the Town Council. Hazard related purposes of the regulations include the following:
  - Protect natural vegetation, wetlands, and scenic areas.
  - Prevent and control erosion, sedimentation, and other pollution of surface and subsurface water.
  - Prevent flood damage to persons and properties and minimize expenditures for flood control.
  - Restrict building on floodlands, shorelands, steep slopes, areas covered by poor soils, or in areas otherwise poorly suited for building or construction.
  - Prevent loss or injury from landslides, expansive soils, and other geological hazards.
- **Chapter 180 Unified Development Code (Zoning):** The purpose of this chapter is to lessen congestion in the streets, to conserve health, to secure safety from fire, flood, and other dangers.

Floodplain Regulations and NFIP Participation

Frisco joined the National Flood Insurance Program (NFIP) on May 15, 1980. The floodplain regulations are defined in Chapter 97 of the Town Code. The Town of Frisco also participates in the Community Rating System (CRS), which means they go above and beyond the minimum NFIP floodplain regulations. The Town currently holds a CRS class ranking of 8, which provides a 10 percent reduction in flood insurance premiums for all policy holders in special flood hazard areas. Frisco achieves its CRS points through the following activities:

- Map Information Services
- Community Outreach Projects
- Floodplain Hazard Disclosure
- Flood Protection Information
- Open Space Preservation

- Higher Regulatory Standards
- Flood Data Maintenance
- Stormwater Management
- Drainage System Maintenance

E.4.2 Administrative/Technical Mitigation Capabilities

Table E-14 identifies the personnel responsible for activities related to mitigation and loss prevention in Frisco.

Table E-14 Frisco—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with Knowledge of Land Development/Land Management Practices	Yes	Community Development	
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	Yes	Community Development and Public Works	
Planner/Engineer/Scientist with an Understanding of Natural Hazards	Yes	Community Development	
Personnel Skilled in GIS	Yes	Community Development and Public Works	Part-time
Full Time Building Official	Yes	Community Development	
Floodplain Manager	Yes	Community Development	
Emergency Manager	No		Summit County Emergency Manager
Grant Writer	Yes	Community Development	
Warning Systems/Services	Yes	Police Department	EPN System/Roam Secure System

E.4.3 Fiscal Mitigation Capabilities

Table E-15 identifies financial tools or resources that Frisco could potentially use to help fund mitigation activities.

Table E-15 Frisco—Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use	Comments
Community Development Block Grants	Yes	
Capital Improvements Project Funding	Yes	
Authority to Levy Taxes for Specific Purposes	Yes	
Fees for Water, Sewer, Gas, or Electric Services	Yes	
Impact Fees for New Development	Yes	
Incur Debt through General Obligation Bonds	Yes	
Incur Debt through Special Tax Bonds	Yes	
Incur Debt through Private Activities	Yes	
Withhold Spending in Hazard Prone Areas	Yes	

E.4.4 Mitigation Outreach and Partnerships

Frisco is also involved in ongoing outreach activities, which include the following:

- The Town has held fire safety classes at the elementary school
- Frisco participates in the Summit County Wildfire Council
- The Blue River Watershed Regional Water Efficiency Plan highlights vulnerabilities to drought and wildfires. This regional plan seeks to raise common themes and water saving opportunities to encourage partnership and collaboration between participating utilities and entities (High Country Conservation Center, 2018).
- Each spring, the governments of Summit County, Breckenridge, Dillon, Frisco and Silverthorne distribute a packet of information to inform the communities about how to prepare for possible high water in May and/or June resulting from snowmelt

E.4.5 Other Mitigation Activities

The Town completed a project to install flood pans on both the north and south sides of Main Street at a cost of $300,000. This activity will specifically address past flooding at the intersection of 7th Avenue and Main Street and will return collected water back to Ten Mile Creek. Frisco is also replacing a culvert on Jug Creek. This particular project was completed as part of the Town's "Step up Main Street" project which focused on fixing drainage on Frisco's Main Street.

E.4.6 Opportunities for Enhancement

Based on the capability assessment, Frisco has several existing mechanisms in place that already help to mitigate hazards. One of these is to amend the Town's Unified Development Code to include wildfire risk reduction standards. This has been detailed as a new mitigation strategy in 2020. Another opportunity would be to improve the CRS rating. The Town has a substantial number of flood insurance policies, and an improved rating could make flood insurance more affordable.

E.5 Mitigation Goals and Objectives

Frisco adopted the hazard mitigation goals and objectives developed by the HMPC and described Chapter 4 Mitigation Strategy.

E.6 Mitigation Actions

The planning team for Frisco identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Frisco will continue participation in and compliance with the NFIP. Specific activities that the Town will undertake to continue compliance include the following:

- Working with FEMA and the State in the map modernization program and adopting new DFIRMs when effective

- Reviewing the flood damage prevention ordinance and identifying opportunities for strengthening the ordinance at the same time it is updated to adopt new DFIRMs
- Continuing participation in the Community Rating System and identifying opportunities to increase points and lower rating, such as through this planning process

Mitigation Action: Frisco—1 Mountain Pine Beetle Infestation/Wildfire Mitigation

Jurisdiction:	Town of Frisco
Action Title:	Continue to implement mountain pine beetle plan to mitigate wildfire hazard
Hazard(s) Mitigated:	Pest Infestation (forest), Wildfire
Priority:	High
Issue/Background	Frisco has been hit hard by the mountain pine beetle infestation. The Town has taken aggressive action to mitigate further infestation and wildfire hazard by removing trees on our 217-acre peninsula, as well as making trees for removal within the Town proper. The Town has worked with the Summit County Mountain Pine Beetle Task Force to develop a multi-year plan to eradicate the problem on the peninsula as well as reforest the property. The Town has recently reimbursed property owners for removal and replanting trees.
Ideas for Implementation:	Continue to complete projects as part of multi-year plan and incorporate into mitigation strategy as appropriate. Finish replanting of peninsula and identifying trees on private property.
Responsible Agency:	Frisco Police Department, Public Works Department, and Community Development Department
Partners:	Summit County Mountain Pine Beetle Task Force
Potential Funding:	Town of Frisco
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	• Reduces risk of wildfire • Reduces erosion • Protects public health and safety • Improves forest health
Timeline:	2013-2019
Status:	**Completed**. As of 2019, the Town of Frisco has cleaned up all of the Pine Beetle infested areas and are seeing no further action needed on this item.

Mitigation Action: Frisco—2 Public Education

Jurisdiction:	Town of Frisco
Action Title:	Improve information on website about natural hazard risk and mitigation
Hazard(s) Mitigated:	Multi-Hazard: Flood, Wildfire, Winter Weather
Priority:	Low
Issue/Background	Utilizing the Town of Frisco's government website, information in regard to flood and fire risks can be better communicated to Frisco residents. For flooding, Frisco provides sandbags and sand to residents. Sand stockpiles are placed at critical areas where sandbags would need to be filled to protect persons and property. Being able to efficiently communicate where the stockpiles are and where sandbags can be acquired, will assist the Town in spreading the word about the risk that flooding presents to certain residents. In terms of wildfire, it would be worth sharing with visitors to the website the fire danger, and how to protect their homes in the event of a wildfire.
Ideas for Implementation:	Public information about natural hazard risk and mitigation is available on the Town's website. The Town will continue to update the website and providing resources and valuable information to the public. Incorporate new and improve existing material on the website related to the following types of information: • The National Flood Insurance Program and reduced premiums received through the Town's participation in the Community Rating System. • The Summit County Multi-Hazard Mitigation Plan • Household preparedness measures for severe winter weather and other types of emergencies • Wildfire mitigation and mountain pine beetle programs
Responsible Agency:	Frisco Community Development Department
Partners:	Frisco Police Department, Summit County Office of Emergency Management
Potential Funding:	Town of Frisco
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Using our website as a valuable information tool, to spread knowledge on what to look for in hazardous conditions, and how citizens can best protect their property.
Timeline:	2020-2024
Status:	Annual implementation. The website has been updated on an annual basis

Mitigation Action: Frisco—3 Maintaining NFIP Participation and CRS Rating

Jurisdiction:	Town of Frisco
Action Title:	Maintaining NFIP Participation and CRS Rating
Hazard(s) Mitigated:	Flood
Priority:	Low
Issue/Background	The Town of Frisco will continue to be a member of and in compliance with the NFIP and ensure that our CRS rating is at least an 8.
Ideas for Implementation:	Using our website as a valuable information tool, to spread knowledge on what to look for in hazardous conditions, and how citizens can best protect their property.
Responsible Agency:	Town of Frisco Community Development Department
Partners:	Summit County Office of Emergency Management
Potential Funding:	Town of Frisco
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	CRS participation assists in lowering flood insurance premiums in regard to property loss due to flooding. NFIP compliance will help ensure safe and prudent development in regard to flood hazards.
Timeline:	2020-2024
Status:	New in 2020

Mitigation Action: Frisco—4 Amend Unified Development Code

Jurisdiction:	Town of Frisco
Action Title:	Amend the Town's Unified Development Code to include wildfire risk reduction standards.
Hazard(s) Mitigated:	Wildfire
Priority:	Medium
Issue/Background	Adopt amendments to the Frisco Unified Development Code (zoning and subdivision standards) that implement wildfire risk reduction best practices, including amendments that complement the recently adopted fire code standards for defensible space.
Ideas for Implementation:	
Responsible Agency:	Frisco Community Development Department
Partners:	
Potential Funding:	Town of Frisco
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Reduce wildfire risk to people and property.
Timeline:	2020-2024
Status:	New in 2020

E.7 Implementation and Maintenance

Moving forward, the Town will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

E.7.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Town to help inform updates and the development of local plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

Risk and vulnerability information the 2013 Summit County Hazard Mitigation Plan and the Town of Frisco annex was used to inform the 2019 update to the Town of Frisco Community Plan, as noted in section E.4 Capability Assessment. The plan acknowledges that natural hazards exist and influence how the Town has grown and will develop. Hazard mitigation is also noted as high priority for the Town. Refer to subsection E.4.1 Regulatory Mitigation Capabilities for more information related to the integration and acknowledgment of the hazards in the Town's Community Plan.

Process Moving Forward

Moving forward, the Planning Division may utilize the hazard information when reviewing a site plan or other type of development applications and the Public Works department may utilize the hazard information when updating the Town's Capital Improvement Plan annually. The Town will also incorporate this HMP into future updates to the Town of Frisco Community Plan.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Frisco will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting

E.7.2 Monitoring, Evaluation and Updating the Plan

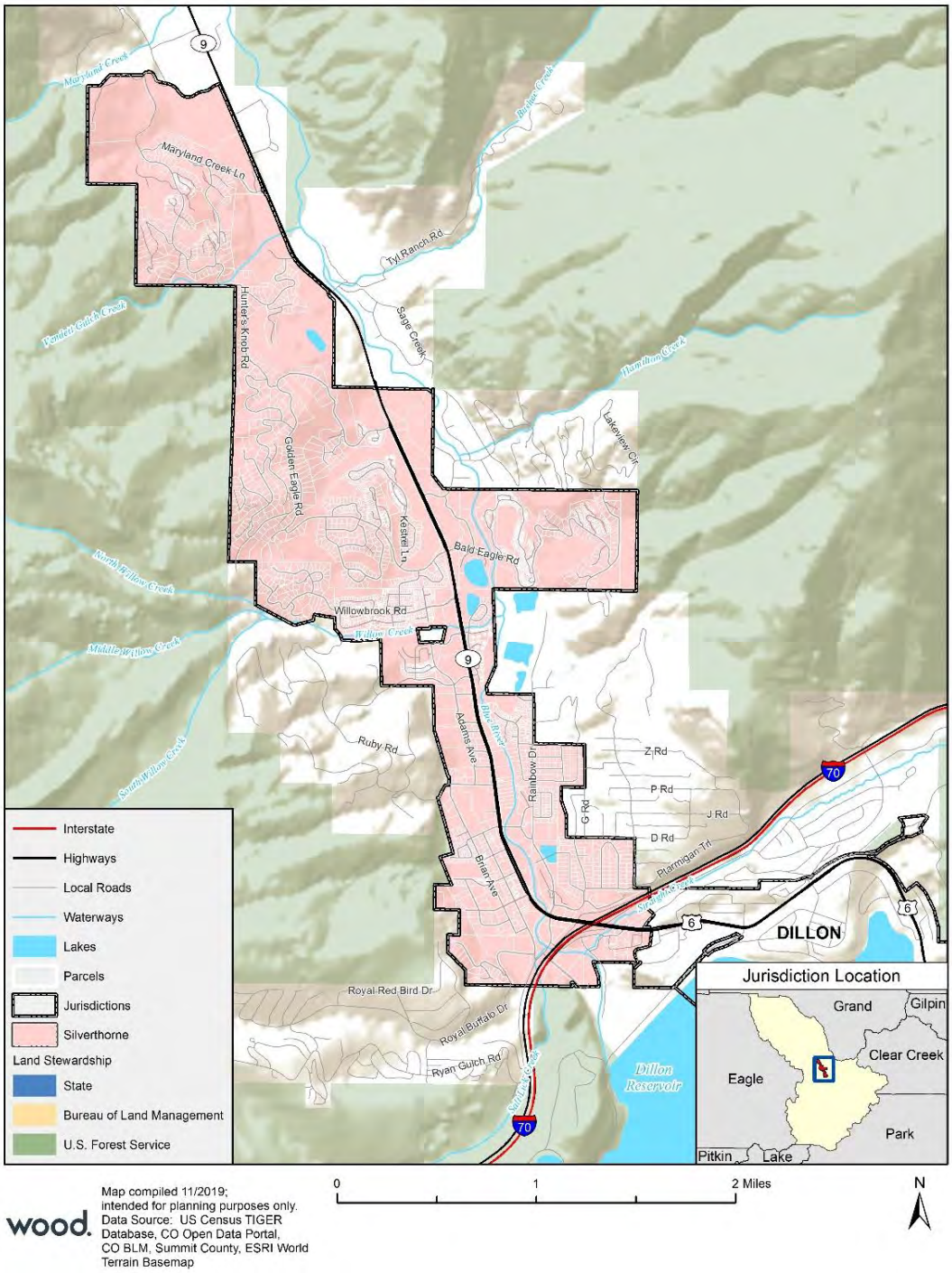
The Town will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The Town will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The Community Development and Public Works Directors, or their designee will be responsible for representing the Town in the County HMPC, and for coordination with Town staff and departments during plan updates. The Town realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

Annex F: Town of Silverthorne

F.1 Community Profile

Figure F-1 shows a base map of the Town of Silverthorne and its location in Summit County.

Figure F-1 Town of Silverthorne



Geography

Silverthorne is in the center of Summit County at an elevation of 8,790 feet, just downstream from Lake Dillon on the Blue River. The Blue River flows north through the Town. Its discharge through Silverthorne is regulated by the Dillon Dam. Straight Creek, Willow Creek, and the smaller Vendett Gulch Creek are tributaries of the Blue River that flow through Silverthorne (as displayed in the figure above). The Town is nestled below Buffalo Mountain and Red Peak, both part of the Gore Range to the west, and Ptarmigan Mountain and the Williams Fork Range to the east. Both sides of the valley are characterized by steep hillsides.

The climate of Silverthorne is that of a Colorado alpine valley. The mean annual temperature is approximately 35°F, with minimum daily temperatures averaging approximately 16°F and maximum daily temperatures averaging approximately 52°F. The lowest annual temperature averages approximately -45°F and the highest yearly temperature averages approximately 89°F. Total annual precipitation averages 18.4 inches, with approximately 140 inches of snow.

Population

The estimated 2018 population of the Town of Silverthorne was 4,821. Select U.S. Census data and American Community Survey (ACS) 2013-2017 estimates of demographic and social characteristics for Silverthorne are summarized in Table F-1.

Table F-1 Silverthorne Demographic and Social Characteristics

Characteristic	2013-2017 Estimate
Gender/Age	
Male	59.7%
Female	40.3%
Under 5 Years	5.8%
65 Years and Over	18.4%
Median Age	46.6
Race/Ethnicity (one race)	
White	64.6%
Black or African American	5%
Asian	0%
Native Hawaiian and Other Pacific Islander	0%
Other	0%
Hispanic or Latino (Of Any Race)	30.1%
Other	
Average Household Size	2.68
High School Graduate or Higher	85.4%

Source: ACS 2013-2017; US Census (factfinder.census.gov)

History

Incorporated in 1967, Silverthorne began as a residential area approximately two miles north of the old Town of Dillon. The Town is named for Judge Marshall Silverthorn who bought 160 acres at the Town's current location in 1881. Original subdivisions in the 1950s were home to the construction workers building the Dillon Dam.

Economy

According to the 2017 State Demography Office in Colorado, the industries that employed the highest percentages of Silverthorne's labor force were: accommodation and food services (26.9%); retail trade (12.2%); government (9.8%); and real estate, rental, and leasing (8.2%).

Other select economic characteristics for Silverthorne were obtained from the 2013-2017 ACS estimates and the U.S. Census (Table F-2).

Table F-2 Silverthorne Economic Characteristics

Characteristic	2013-2017 Estimates
Families below Poverty Level	8.4%
Individuals below Poverty Level	13.2%
Median Home Value	$593,400
Median Household Income	$50,727
Per Capita Income	$33,959
Population Employed	76.8%

Source: ACS 2013-2017; US Census (factfinder.census.gov)

F.2 Hazard Identification and Profiles

Silverthorne's HMPC identified the hazards that affect the community and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and overall significance specific to the Town (see Table F-3). In the context of the countywide planning area, there are no hazards that are unique to Silverthorne.

Table F-3 Silverthorne Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Occasional	Negligible	Low
Dam Failure	Large	Unlikely	Catastrophic	High
Drought	Large	Likely	Limited	Medium
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Flood	Small	Likely	Critical	High
Hazardous Materials Release (Transportation)	Isolated	Occasional	Critical	High
Landslide, Mudflow/Debris Flow, Rockfall	Medium	Likely	Limited	Medium
Lightning	Large	Highly Likely	Critical	Medium
Pest Infestation (Forest and Aquatic)	Medium	Likely	Limited	Medium
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Small	Likely	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Limited	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

F.3 Vulnerability Assessment

The intent of this section is to assess Silverthorne's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk to hazards for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan.

Community Asset Inventory

Table F-4 shows the total number of improved parcels, properties, and their improvement and content values for the Town of Silverthorne. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, 150% for Utility structures, 100% for Agricultural and Commercial structures, and 0% for Exempt and Vacant parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table F-4 Silverthorne Improved Parcel and Property Exposure

Parcel Type	Parcel Totals	Total Properties*	Improved Value	Content Value	Total Value
Agricultural	2	4	$1,290,612	$1,290,612	$2,581,224
Commercial	103	205	$179,272,811	$179,272,811	$358,545,622
Exempt	251	293	$0	--	$0
Residential	1,844	2,210	$1,480,162,238	$740,081,119	$2,220,243,357
Utilities	1	1	$884,138	$1,326,207	$2,210,345
Vacant	2	3	$555,300	--	$555,300
Total	**2,203**	**2,716**	**$1,662,165,099**	**$921,970,749**	**$2,584,135,848**

Source: Summit County Assessors Data, November 2019.
*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table F-5 lists summary information about the 20 critical facilities and other community assets identified by Silverthorne's HMPC as important to protect or provide critical services in the event of a disaster. Table F-6 details more information on the critical facilities in question found in Silverthorne. Note that there were several critical facilities the HMPC indicated should not be disclosed in terms of location or name, so while they were considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, they will not be described in detail nor will they be shown in any maps. As such, the detailed facility list only contains information for 19 of the 20 facilities. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the main plan HIRA document.

Table F-5 Silverthorne Critical Facilities and Infrastructure Summary

FEMA Lifeline Category	Critical Facility Type	Total Critical Facilities
Communications	Information Centers	1
Food/Water/Shelter	Wastewater Facilities	2
Hazardous Materials	HazMat Tier II SARA Facilities	6
Other/Schools	Schools	1
Safety and Security	Fire Lookout Locations	1
	Government Buildings	7
	Incident Facilities*	1
	Police Stations	1
TOTAL		**20**

* This facility's location will not be disclosed, and no additional details will be provided.
Source: Summit County, HIFLD.

Table F-6 Detailed List of Critical Facilities and Infrastructure in Silverthorne

FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location	Notes or Additional Details
Communications	Information Centers	Silverthorne Elementary Information Center	Hwy 9 and Hamilton Creek	
		Silverthorne Elementary Information Center	Hwy 9 and Hamilton Creek	
Food/Water/ Shelter	Wastewater Facilities	Buffalo Mtn Waste Water Treatment		
		JSA Waste Water Treatment Plant		
Hazardous Materials	HazMat Tier II SARA Facilities	Vista Auto Group	171 W 9th St, Silverthorne 80498	Lake Dillon Fire Protection District *(now Summit Fire & EMS)*
		Lowes	201 Buffalo Mountain Dr, Silverthorne 80498	Lake Dillon Fire Protection District *(now Summit Fire & EMS)*
		Excel Energy	200 W 6th St, Silverthorne 80498	Lake Dillon Fire Protection District *(now Summit Fire & EMS)*
		UPS	337 W 4th St, Silverthorne 80498	Lake Dillon Fire Protection District *(now Summit Fire & EMS)*
		Comcast of Colorado V, LLC	249 Warren Ave, Silverthorne 80498	Lake Dillon Fire Protection District *(now Summit Fire & EMS)*
		Waste Management	314 W 3rd St, Silverthorne 80498	Lake Dillon Fire Protection District *(now Summit Fire & EMS)*

FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location	Notes or Additional Details
Other/Schools	Schools	Silverthorne Elementary School		$14 M replacement
Safety and Security	Fire Lookout Locations			
	Government Buildings	Silverthorne Public Works		
		USPS Silverthorne		
		Silverthorne Town Hall		
		County North Branch Library		
		CDOT Maintenance Buildings - Silverthorne		
		Silverthorne Recreation Center		
		USFS Dillon Ranger District Office		
	Police Stations	Silverthorne Police Department	601 Center Cir, Silverthorne 80498	$8.5 M replacement

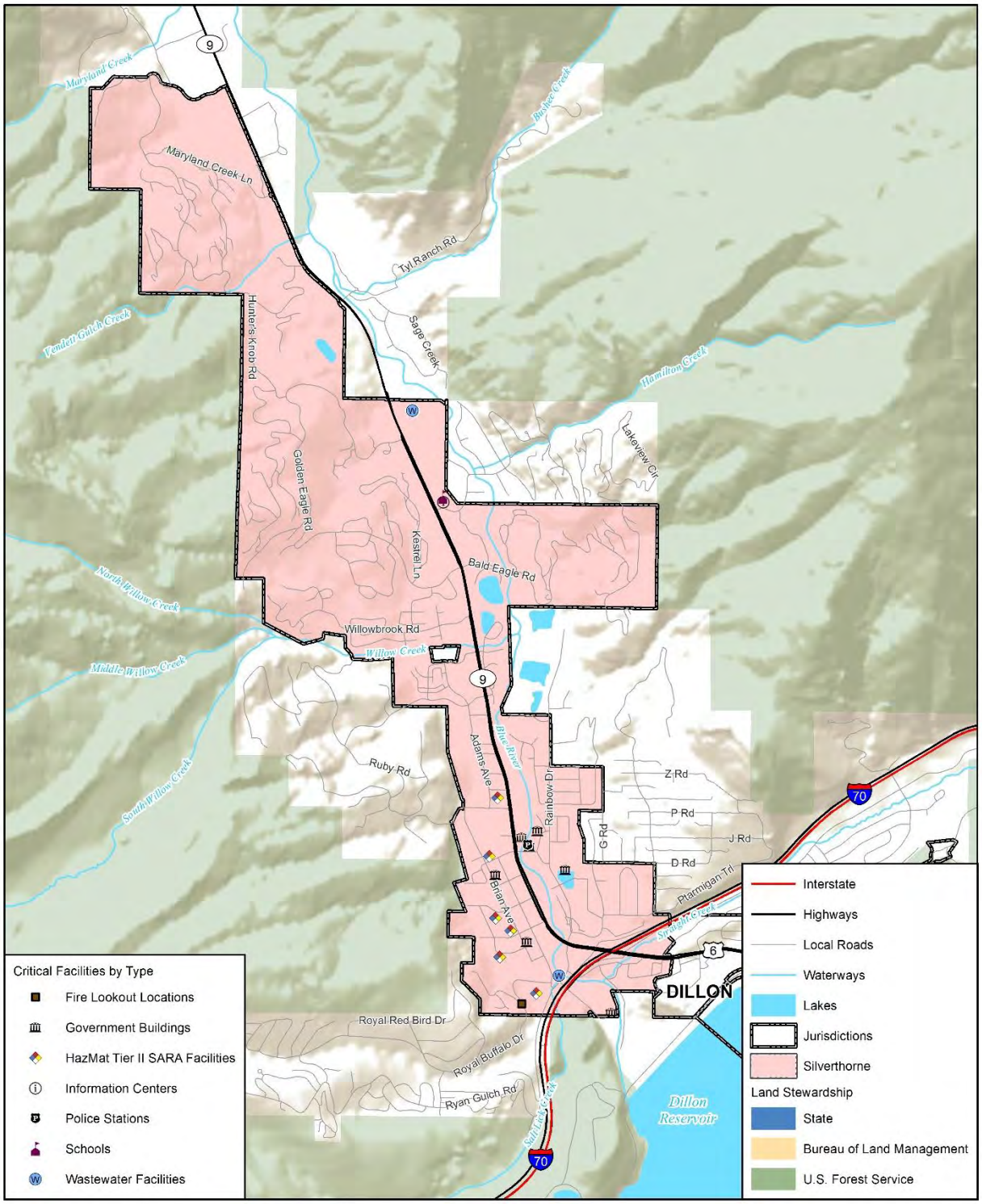
Source: Summit County GIS, Summit County HMPC.

Interstate-70 is also a critical facility and key asset to the community. The locations of critical facilities in Silverthorne identified by Summit County GIS are illustrated in Figure F-2.

In addition, the following assets were noted by the HMPC.

- Medical Offices: $ 3 Million
- Fire Station: $ 2.5 Million
- Summit Education Center: $ 5 Million

Figure F-2 Critical Facilities and Infrastructure in Silverthorne



Map compiled 11/2019;
intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, HIFLD

Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan.

- Drought
- Earthquake
- Erosion/Deposition
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Only Dam Inundation, Flood, Hazardous Materials Release, Landslide/Mudflow/Debris Flow/Rockfall, and Wildfire hazards will be profiled in the following vulnerability assessment sections, due to the ability to quantify vulnerability further with available data .

Dam Failure

General Property

The Dillon Dam and Reservoir are located approximately 0.5 miles upstream of the southern corporate limits of Silverthorne. As discussed in Chapter 3 Risk Assessment of the main plan, failure of the Dillon Dam would have catastrophic effects to the Town of Silverthorne, damaging and destroying the majority of structures. The dam failure inundation map contains sensitive information and is not available in this public planning document. Based on a GIS analysis performed with the county parcel layer and the available dam inundation mapping (for planning purposes only), the following potential damages would be expected in Silverthorne.

Table F-7 Estimated Dam Inundation Risk to Properties in Silverthorne

Parcel Type	Total Properties Exposed	Improved Value	Content Value	Total Value	Population Exposed
Agricultural	3	$588,768	$588,768	$1,177,536	--
Commercial	202	$179,190,729	$179,190,729	$358,381,458	--
Exempt	25	$0	--	$0	--
Residential	1,233	$755,924,214	$377,962,107	$1,133,886,321	3,822
Utilities	1	$884,138	$1,326,207	$2,210,345	--
Vacant	3	$555,300	--	$555,300	--
TOTAL	**1,467**	**$937,143,149**	**$559,067,811**	**$1,496,210,960**	**3,822**

Source: Summit County GIS and Assessor's Office, U.S Census, Wood Analysis

People

Based on the GIS analysis summarized in the table above, it is expected that around 3,822 people in Silverthorne might be at risk of dam inundation hazards. These totals were estimated by multiplying the average number of persons per household in Summit County (which equals 3.10) times the number of residential properties where dam inundation extents were available.

Critical Facilities and Infrastructure

Based on the critical facility inventory considered in the updating of this plan and intersected with the dam inundation extents available for the Town of Silverthorne, 19 critical facilities were found to be at potential risk. These are summarized in the table below.

Table F-8 Critical Facilities in Silverthorne at Risk of Dam Inundation

FEMA Lifeline Category	Critical Facility Type	Total Critical Facilities
Communications	Information Centers	1
Food/Water/Shelter	Wastewater Facilities	2
Hazardous Materials	HazMat Tier II SARA Facilities	6
Other/Schools	Schools	1
Safety and Security	Government Buildings	7
	Incident Facilities	1
	Police Stations	1
TOTAL		**19**

Source: Summit County, HIFLD, Wood Analysis

Economy

A dam inundation event that affected the major roads which give access to the Town (e.g. Interstate 70) could significantly affect the local economy, by limiting or completely impeding access to shops, restaurants, hotels, and other major industries which keep the local economy thriving.

Historical, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. For the most part the environment is resilient and would be able to rebound, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would.

Future Development

Most future development occurring in Silverthorne will be at risk to a failure of the Dillon Dam due to the large extent of the inundation potential.

Flood

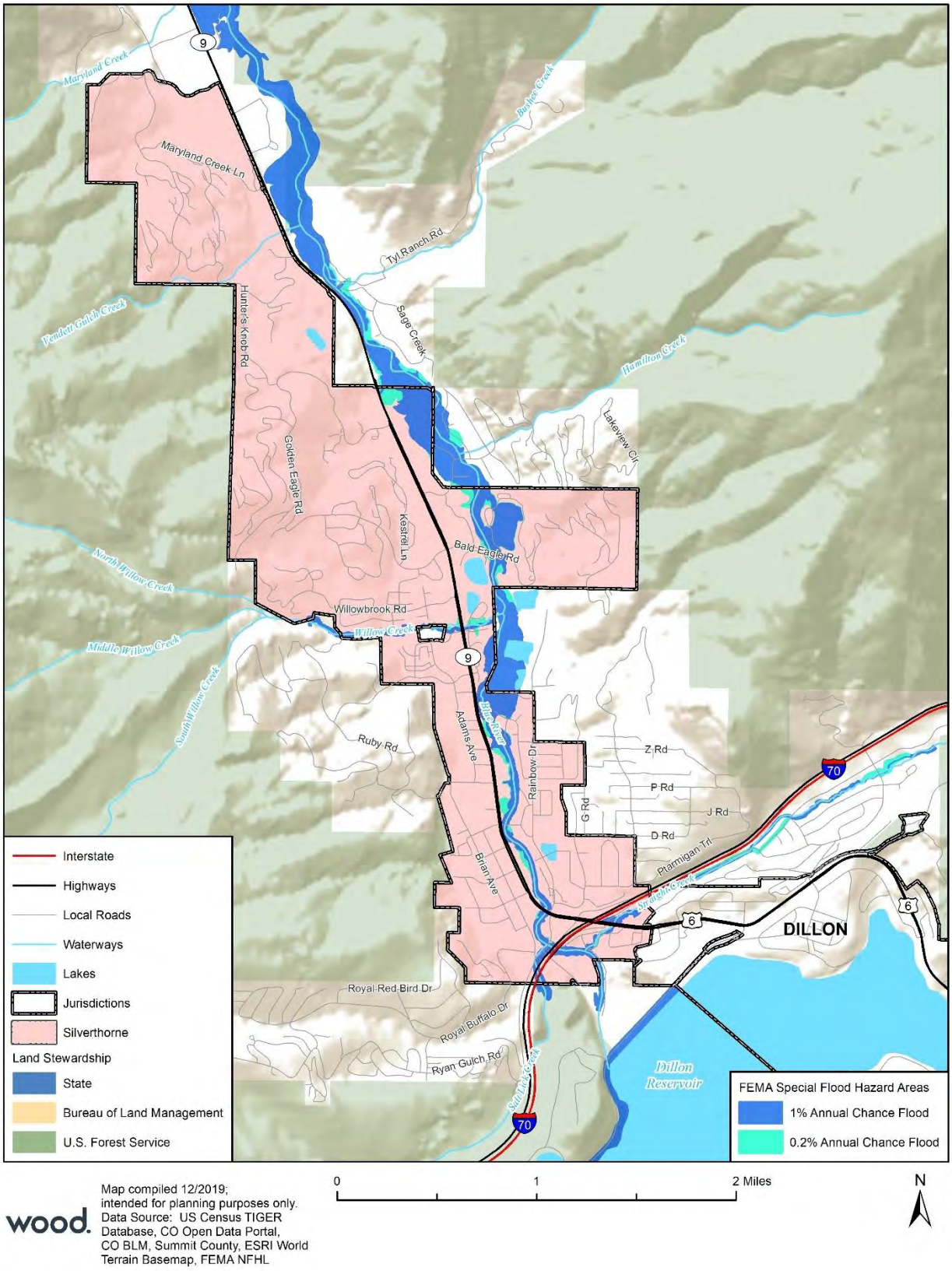
The principal causes of flooding in Silverthorne are along the Blue River, Straight Creek, and Willow Creek from April to July as a result of snowmelt runoff. The largest flood on record prior to the construction of the dam was in 1918 when the combined flow of the Blue River, Ten Mile Creek, and the Snake River was 3,500 cfs just upstream of the present location of Silverthorne. U.S. Geological Survey records show high flows on all three streams during May and June of several other years, but no significant damage was reported.

Dams built by beavers within Willow Creek occasionally result in nuisance flooding to nearby adjacent property owners. Although Willow Creek runs through private property in these locations, the Town has often assisted with dam removal during these emergencies.

General Property

Vulnerability to flooding was determined by summing potential losses to Summit County's properties in GIS, by using the latest FEMA NFHL data along with the Summit County parcel layer the provided by the Assessor's Office. FEMA's NFHL data depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events. This latest NFHL data is current as of September 17, 2019. Figure F-3 below displays the FEMA special flood hazard areas present in the town, color coded based on flood event (i.e. 100-year versus 500-year).

Figure F-3 FEMA Special Flood Hazard Areas in Silverthorne



Map compiled 12/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, FEMA NFHL

Based on the GIS analysis performed with the county parcel layer and the available FEMA flood mapping, the potential risk shown in Table F-9. Silverthorne's 1% annual chance flood zone has 68 properties with a total value of over $16.4 million. For the 0.2% annual chance flood zone 8 additional properties are exposed. The highest number of exposed properties are Residential, followed by the Exempt, Commercial, and Vacant categories. The combined loss estimates for the properties in the floodplains (both 1% and 0.2% annual chance events) is around $5.14 million.

Table F-9 Summary of Properties Vulnerable to Flood in Silverthorne, by Type

Flood Zone	Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population
100-year	Residential	22	$10,602,785	$5,301,393	$15,904,178	$3,976,044	68
	Exempt	6	$0	--	$0	$0	--
	Commercial	2	$276,702	$276,702	$553,404	$138,351	--
TOTAL		**30**	**$10,879,487**	**$5,578,095**	**$16,457,582**	**$4,114,395**	**68**
500-year	Vacant	2	$554,800	--	$554,800	$138,700	--
	Residential	5	$2,375,606	$1,187,803	$3,563,409	$890,852	16
	Exempt	1	$0	--	$0	$0	--
TOTAL		**8**	**$2,930,406**	**$1,187,803**	**$4,118,209**	**$1,029,552**	**16**
GRAND TOTAL		**38**	**$13,809,893**	**$6,765,898**	**$20,575,791**	**$5,143,948**	**84**

Source: Summit County, FEMA NFHL, U.S. Census Bureau, Wood analysis

Flood Insurance Policy Analysis

NFIP insurance data indicates that as of September 12, 2019, there were 45 flood insurance policies in force in the Town with $14,395,900 of coverage. This is a decrease of 39 policies since 2013. Ten of the policies were in A zones, and 35 were located outside of the Special Flood Hazard Area (falling within B, C, and X zones). There has been one historical claim for flood losses that did not result in any payments. Thus, there were no repetitive or severe repetitive loss structures.

People

The population exposed to the flood hazards described in the flood vulnerability analysis above was estimated by applying an average household size factor (based on 2018 U.S, Census estimates for Summit County, which equal to 3.1 persons per household) to the number of improved properties identified in the flood hazard areas within Silverthorne. Note that only those parcels of type Residential were used to estimate populations exposed. These estimates yielded the population exposures shown in the table above (Table F-9). As such, the combined 1% and 0.2% annual chance floods would potentially displace 84 people, based on the residential structures which fall in those flood zones. For additional details on potential displacements by flood event, see the Summit County main plan HIRA document.

Critical Facilities and Infrastructure

There are two critical facilities located in flood zones in Silverthorne: the JSA Wastewater Treatment Plant and the USFS Dillon Ranger District Office government building, both of which fall in the 500-year flood zone. The USFS Dillon Ranger District Office was removed from the FEMA floodplain as part of a restudy and LOMR (Letter of Map Revision) process through FEMA, approved in 2013.

Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, and other downtime costs. Flooding often coincides with the busy summer

tourism months in Summit County, and may impact, directly or indirectly (such as from the negative perception of potential danger to his hazard), the revenues of shops, restaurants, hotels, and other major industries which keep the local economy thriving. In addition, major flooding which led to road or other infrastructure closures could additionally limit access to the Town by tourists, locals, and even basic goods and services.

Historical, Cultural, and Natural Resources

The environment is mostly resilient to general flooding. However, cultural or historic properties within floodplains would be affected in similar ways as property and critical facilities/infrastructure, especially those with underground or basement levels where water would easily seep and potential ruin archives, resources, or other important assets.

Future Development

Based upon the most recent 2019 FEMA NFHL data and Summit County's parcel layer, there is development within the 100- and 500-year floodplain in Silverthorne. Most development in the floodplain occurs along the stretch of the Blue River between 6th Street and Rainbow Court. The Town's flood damage prevention ordinance regulates development in special flood hazard areas.

Significant wetland areas exist east of State Highway 9 and north of 12th Street in Silverthorne as the Blue River meanders northwards. There are also many wetland areas adjacent to ponds, streams, and tributaries to the Blue River. Water bodies, wetlands and riparian areas are protected by the water body, wetland, and riparian protection regulations of the Town Code (Town of Silverthorne 2004).

Silverthorne is considering the development of a kayak park in the Blue River for recreational purposes. Because the park would be considered development within the floodway, the Town has requested and has received a conditional letter of map revision from FEMA. The FEMA-issued CLOMR is dated March 18, 2008. While the Town still desires to build the kayak park, other, higher priorities have postponed completing it. Timing for completion of this is uncertain.

Hazardous Materials Release (Transportation)

The six identified hazardous materials (HazMat) facilities in the Town of Silverthorne are summarized below for reference, by name and address.

Table F-10 Hazardous Materials Facilities in Silverthorne

Name	Address
Comcast of Colorado V, LLC	249 Warren Ave.
Excel Energy	200 W 6th St.
Lowes	201 Buffalo Mountain Dr.
UPS	337 W 4th St.
Vista Auto Group	171 W 9th St.
Waste Management	314 W 3rd St.

Source: Summit County GIS

General Property

The impact of most fixed facility incidents is typically localized to the property where the incident occurs. Based on Table F-10 above, those properties or parcels found immediately adjacent to these facilities could potentially be affected by a spill or incident if, for example, road closures were required which could

prevent those in the nearby areas from getting around. However, it is not expected that significant impacts or damages would be incurred to those properties in the vicinity of the HazMat facilities in Silverthorne.

People

As mentioned in the General Property subsection above, people could be temporarily affected by HazMat incidents if they were found in the near vicinity of a facility that suffered an accident, especially if road or other access was limited during cleanup. Depending on the degree of severity of a spill, however, HazMat incidents could lead to injuries, hospitalizations, and even fatalities to people nearby. People living near hazardous facilities and along transportation routes may be at a higher risk of exposure, particularly those living or working downstream and downwind from such facilities. For example, a toxic spill or a release of an airborne chemical near a populated area can lead to significant evacuations and have a high potential for loss of life if people were to inhale damaging fumes.

Critical Facilities and Infrastructure

Impacts of hazardous material incidents on critical facilities are most often limited to the area or facility where they occurred, such as at a transit station, airport, fire station, hospital, or railroad. However, they can cause long-term traffic delays and road closures resulting in major delays in the movement of goods and services.

Economy

Because of the presence of major roads in Silverthorne such as I-70, and Highway 9, and U.S. Highway 6, a potential HazMat incident which led to temporary closures of these roads might significantly impact the local economy, impeding access of important resources or even tourism into or out of the town.

Historical, Cultural, and Natural Resources

HazMat hazards could contaminate the local groundwater and eventually the municipal water supply, or even migrate to a major waterway or aquifer. If this was the case, Silverthorne's potable water, recreational water, other water uses, and overall natural resources would be severely compromised. Impacts on wildlife can also be significant.

Future Development

The amount of hazardous materials that are stored, used, and transported across the county are not anticipated to increase over the next five years based on regional growth trends. As such, future development should not be significantly affected by HazMat hazards.

Landslide, Mudflow/Debris Flow, Rockfall

General Property

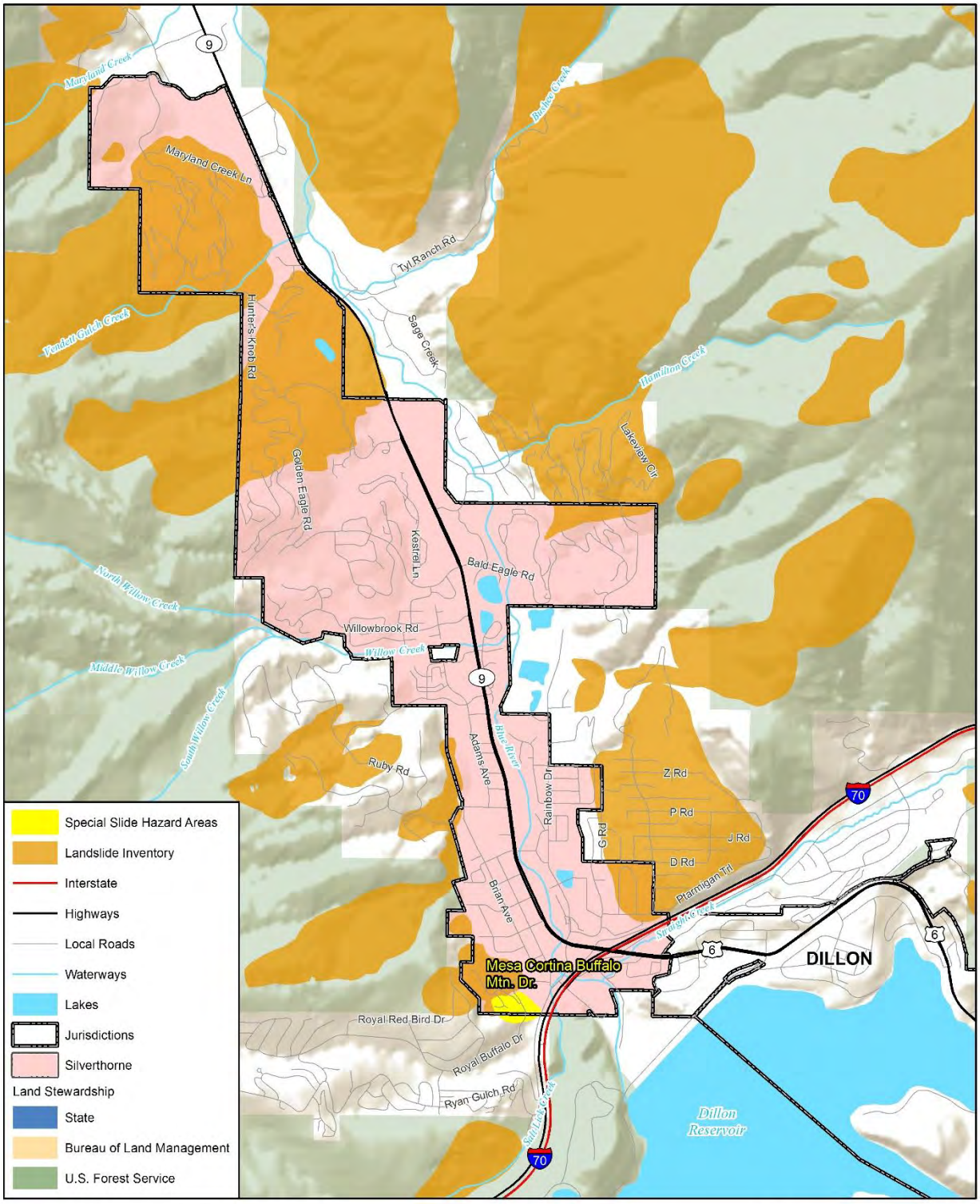
The majority of the Silverthorne community is located in areas that have limited potential for landslide, mudflow, debris flow, or rockfall hazards. While most of the town itself is relatively flat, the Eagles Nest, Willow Creek Highlands, and South Maryland Creek Ranch subdivisions in the northwestern portion of the town have been developed on forested hillsides. Angler Mountain Ranch subdivision, located in the northeastern portion of the Town, has been developed on a sage meadow hillside.

There are several areas in the Town that have slopes between 10 and 20 percent. These areas are located primarily west of Highway 9 in and around Golden Eagle Road in the Willowbrook Subdivision. South of Golden Eagle Road there are slopes between 10 and 20 percent along the westernmost edge of town, west of Brian Avenue and Adams Avenue, and west of Warren Avenue. Slopes of this same percent are also found in the portion of Town that extends east in and around Angler Mountain Ranch. There are also

many slopes within the Town and its immediate vicinity that are over 30 percent (Silverthorne Comprehensive Plan, 2008).

As shown in Figure F-4 below, a special slide hazard area is also present in the southernmost edge of the town, in the Mesa Cortina Buffalo Mountain Drive area. However, no improved properties were found exposed to that special landslide hazard area, shown in yellow.

Figure F-4 Landslide Hazard Areas in Silverthorne



Map compiled 11/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CGS

Potential losses for general landslide areas were estimated using Summit County GIS and assessor's parcel data. Based on the GIS analysis performed, the potential risk to general landslide areas in Silverthorne is summarized in Table F-11. For the purposes of this analysis, if a parcel's centroid intersected the landslide hazard polygons, that parcel is assumed to be at risk.

Silverthorne's Residential properties have the highest exposure with a total value of over $323 million, followed by Agricultural, Commercial, and Exempt properties. A total of 268 properties are exposed to landslide hazards, with over $327.2 million in values.

Table F-11 Property Exposure to General Landslide Areas in Silverthorne

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Agricultural	4	$1,290,612	$1,290,612	$2,581,224	--
Commercial	3	$790,100	$790,100	$1,580,200	--
Exempt	1	$0	--	$0	--
Residential	260	$215,375,956	$107,687,978	$323,063,934	806
TOTAL	268	$217,456,668	$109,768,690	$327,225,358	806

Source: Summit County GIS/Assessor Office, Colorado Geological Survey, U.S. Census, Wood analysis

People

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways. Based on Table F-11 above, an estimated 806 people could be at risk of general landslide hazards in Silverthorne. At risk population was estimated by multiplying the average number of persons living in each household in Summit County (which is 3.1 per home) times the number of properties of type "residential" where landslide areas have been inventoried in Silverthorne.

Critical Facilities and Infrastructure

Only one critical facility is found at risk of landslide hazards in Silverthorne. It is a fire lookout spot located in the Mesa Cortina Buffalo Mountain Drive special slide hazard area, in the southernmost west corner of the town. This facility is categorized under the Safety and Security FEMA Lifeline. Major transportation routes present in the town and hence key infrastructure allowing access in and out of it include Interstate 70, Highway 9, and U.S. Highway 6. These routes could be affected by the geologic hazards in question if closures were required, impeding the normal flow of goods and services, for example.

Economy

Economic impacts related to landslide, rockfall, debris fall, and mudslide hazards typically center around transportation routes temporarily closed by debris flow or other activity. The major routes mentioned above (I-70, Hwy 9, and U.S. Hwy 6) would be at most risk due to their heavy flow of goods, services, and populations which keep the economy thriving.

Historical, Cultural, and Natural Resources

As primarily natural processes, landslides and debris flows can have varying impacts to the natural environment as well as cultural or historical resources found on their path. For buildings and other structures, impacts would be similar as those seen on general property or critical facilities/infrastructure.

Future Development

The Town's subdivision regulations address procedures and requirements for development in geologic hazard areas. The following information was extracted from the Silverthorne Comprehensive Plan (2008).

Slope is the most limiting factor to be considered in the design of access roads and residential subdivisions. Slope stabilization in the Silverthorne area is difficult even where homes are constructed on nearly level pads. Homes should be designed to use the existing slope as much as possible and keep foundation cuts to a minimum. Roads should be designed to keep cut and fill slopes to a minimum and to provide appropriate snow stacking areas and drainage. Current Town Code standards require paved roads.

The 2014 version of the Silverthorne Comprehensive Plan addresses the fact that the Buffalo Mountain Road area has existing structural problems related to slide hazards. For one, there is the issue that all roads in that development are gravel based and require upgrading (including paving and drainage improvements that will bring them up to Town standards), so that future development can benefit from the safest infrastructure. In addition, future development including mountain bike and pedestrian systems in the form of soft surfaces (to withstand landslide and related activity) would be most recommended.

Wildfire

General Property

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which breaks up areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in Silverthorne. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. From the improvement values were the content values calculated next, as a percentage of property improvement values based on their occupancy type (using FEMA Hazus guidance as follows): a) Commercial parcels received content values worth 100% of their improvements; b) Residential parcels received content values worth 50% of their improvements; and, d) Exempt parcels received content values worth 0% of their improvements. Property improvements and content values were then totaled to arrive at the Total Value column, which is also the estimated value at risk based on FEMA loss curve standards for wildfire hazards.

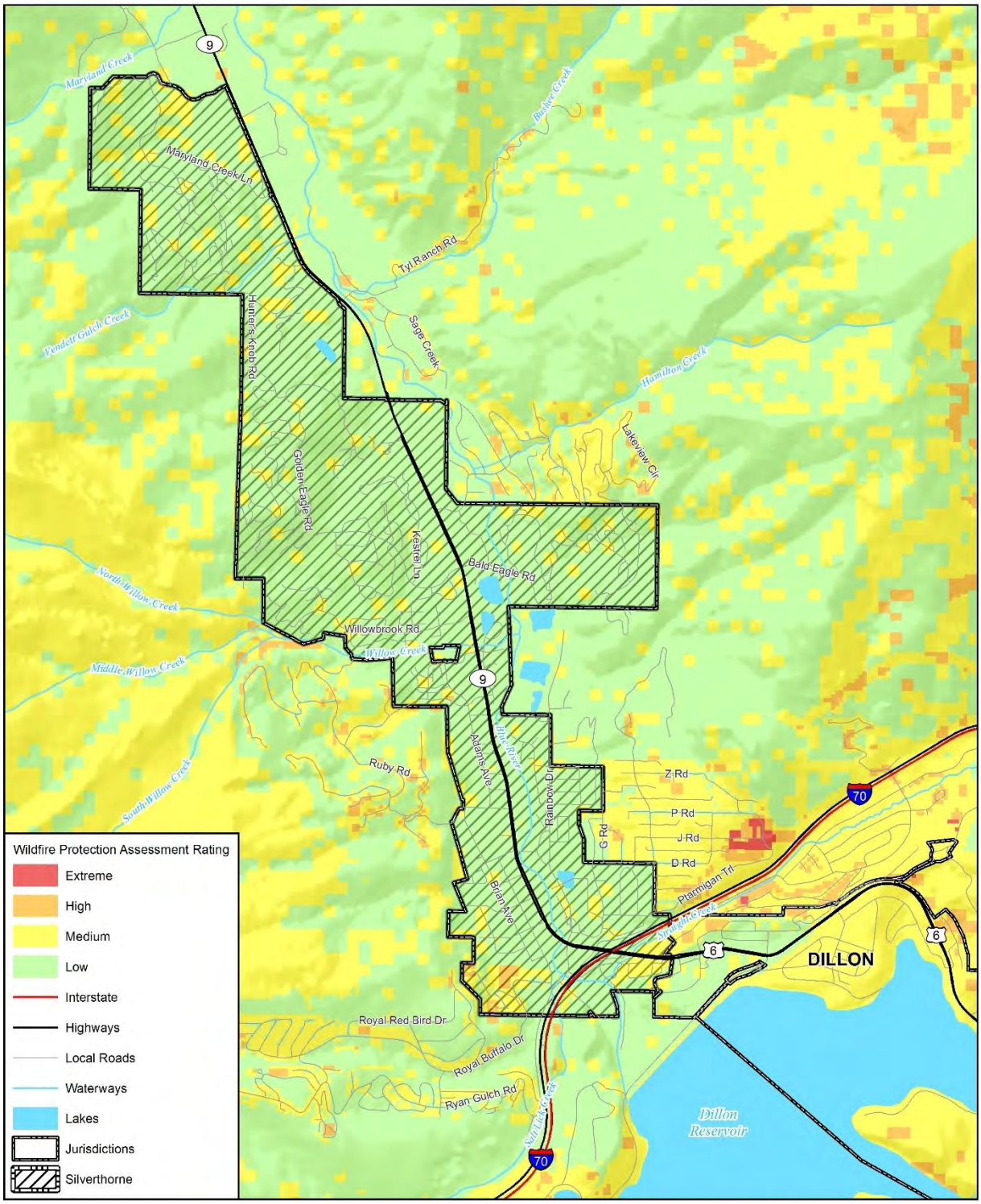
Wildfire protection assessment areas for Silverthorne are displayed in Figure F-5 for reference.

Table F-12 Property Values in Wildfire Zones by Parcel Type, Silverthorne

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Residential	178	$114,290,024	$57,145,012	$171,435,036	552
Exempt	1	$0	--	$0	--
Commercial	56	$44,645,206	$44,645,206	$89,290,412	--
TOTAL	235	$158,935,230	$101,790,218	$260,725,448	552

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis

Figure F-5 Wildfire Protection Assessment Areas and Ratings in Silverthorne



Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard of the main plan HIRA document, all properties at risk of fire hazards are found in Medium rated protection assessment zones due to lower threat. There are 235 properties falling in this category with over $260 million at potential risk, most being Residential in nature. While Summit Fire & EMS, which provides fire protection services to the Town of Silverthorne and surrounding area, is considered an initial attack center for wildland fires on all private land and takes a joint responsibility with the U.S. Forest Service for fires on federal land, property risk is rather low in Silverthorne.

People

The last column of Table F-12 above summarizes the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted, Silverthorne has an estimated 552 people at risk of Medium rated wildfire zones. These totals were estimated by multiplying the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire threat zone/s.

However, smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

There are only two critical facilities found in wildfire assessment areas in Silverthorne, as listed below. They both fall in the Medium rated wildfire category, and belong to the Safety and Security FEMA Lifeline:

- Fire lookout spot (near Mesa Cortina area)
- USPS Silverthorne building

Economy

Tourism, the accommodation and food services industry (e.g. hotels and restaurants), and retail are major components of Summit County's economy, and Silverthorne's as well. Wildland fires can, for example, lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation, stays in hotels, spending on restaurants and other commerce sources, and more.

Historical, Cultural, and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after the fire.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important historical assets in Silverthorne.

Future Development

As Silverthorne grows and development on steep hillsides continues to be considered, the hazard potential will increase. Wildfire hazards, especially the wildland-urban interface, are becoming a larger issue in Silverthorne and the surrounding public lands. This is largely due to the fact that most of the valley floor in the Town has been developed, and residential subdivisions are now being built on the forested slopes that surround the Town. Areas of significant concern include the Wildernest and Mesa

Cortina subdivisions located in Summit County (but within Silverthorne's three-mile area), and the Ptarmigan Mountain area (Government Small Tracks Subdivision) on the southeast side of the Town. Many of these subdivisions do not comply with current fire codes and present significant challenges to the fire district, especially with regard to access. The Eagles Nest and Willow Creek Highlands subdivisions, the Daley Ranch, and Angler Mountain Ranch on the northeast side of town are other areas were wildfire hazard is a concern. In the past several years, recent annual outbreaks of pine beetle infestation in the forested areas around the Town have resulted in large numbers of dead trees which also creates safety and fire hazards. The Town Code requires the removal of dead, diseased, and/or beetle infested trees from properties upon receipt of written notice from the Town to the property owner (Silverthorne Comprehensive Plan, 2008). Nevertheless, Silverthorne's Fire Hazard Mitigation ordinance establishes permitted fire mitigation standards for new and existing development.

For additional information on wildfire and hazard mitigation across Summit County, refer to the main plan or the Summit County Community Wildfire Protection Plan, re-adopted in 2018.

Growth and Development Trends

Table F-13 summarizes how Silverthorne has grown in terms of population and number of housing units between 2011 and 2017, based on the State of Colorado Demography Office figures.

Table F-13 Change in Population and Housing Units in Silverthorne, 2011-2017

2011 Population	2017 Population	Population Percent Change 2011-2017	2011 Total Housing Units	2017 Total Housing Units	Housing Units Percent Change 2011-2017
3,815	4,821	26%	2,051	2,366	15.4%

Source: HMPC and Colorado Demography Office, 2017

In 2019, the Town of Silverthorne building department issued permits for 140 residential/multi-family units. The majority of this growth occurred in the subdivisions of Angler Mountain and Summit Sky Ranch. Residential building permits in coming years are expected to remain steady. There is a total of 2,688 acres within the incorporated limits of the Town. At the end of 2019, there were a total of 4,205 zoned residential units, of which 2,756 have been platted, and 2,481 have been built.

F.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

Regulatory Mitigation Capabilities

Table F-14 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Silverthorne.

Table F-14 Silverthorne's Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Comprehensive Plan	Yes	Update process to begin in 2020
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Growth Management Ordinance	No	
Floodplain Ordinance	Yes	
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	Yes	Removal of Dead Diseased and Beetle Infested Trees
Building Code	Yes	2018 International Building Code (effective January 1, 2020), 2012 International Fire Code and Amendment, 2012 International Energy Conservation Code
Fire Department ISO Rating	Yes	Rating: 4
Erosion or Sediment Control Program	Yes	
Stormwater Management Program	Yes	
Site Plan Review Requirements	Yes	
Capital Improvements Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	No	Incorporated in Summit County Emergency Operations Plan
Other Special Plans	Yes	Dam Failure; Parks, Trails, and Open Space Master Plan
Flood Insurance Study or Other Engineering Study for Streams	Yes	FEMA Flood Insurance Study for Summit County and Incorporated Areas, November 16, 2018
Elevation Certificates	Yes	
Other	Yes	Community Rating System Rating: 8

Silverthorne Comprehensive Plan, 2014

The Silverthorne Comprehensive Plan, originally developed in 2001 and last updated in 2014, defines a long-term vision for the Town. The goals of the Comprehensive Plan are the following:

- Protect the health, safety, and general welfare of the citizens in the community,
- Improve the physical, social, and economic environment of the community, and
- Understand and make decisions on proposed short-term, individual actions that are based upon the long-range impacts of those actions.

In addition, the 2014 plan update more specifically seeks to:

- Provide a framework that supports informed and consistent decision making by Town elected officials, appointed officials, and staff,
- Outline a series of long range goals and policies concerning: land use, transportation, community design, and annexation of lands within three miles of Town limits,
- Guide public investment and the provision of services, and
- Establish policies to balance the rights of the individual with the interests of the community at large.

Chapter 3 Community Vision describes the town's community values as they relate to overall vision, land use, transportation, design, growth, and economic development.

Chapter 4 Goals and Policies contains detailed information on the Land Use Element, namely the following goals and policies related to environmental resource conservation and/or hazard mitigation:

- **Goal LU 1: Land Use Pattern -** Establish a pattern of future land uses that promotes health, safety, and well-being for all members of the community; makes the most efficient use of land, community facilities, and services; promotes economic vibrancy; and protects and integrates natural resources
    - **Policy LU 1.5** - Integrate and establish public lands including parks, open space and trails, throughout Silverthorne to provide access to the outdoors for all residents, as well as to provide buffers and greenspace for environmental protection and hazard mitigation.
    - **Policy LU 1.9 -** Utilize sound land use planning principles when considering re-zonings and density increases in order to manage growth, ensure compatibility with surrounding developments, contain the urban form, protect environmental resources, and account for fiscal impacts.
- **Goal LU 2: Commercial Centers -** Establish a hierarchy of commercial activity in Silverthorne, focused on the Town Core and Gateway Districts to reinforce Silverthorne's economic sustainability and add to the year-round experience for residents and visitors.
    - **Town Core District Policy TC.5** - Shift emphasis from moving traffic on State Highway 9 to adopting the street as civic space. Create a strong hierarchy of linked streets through and around the Core that support various forms of transit and mitigate impacts to traffic.
    - **Business Park District Policy BP.2** - Ensure that new development is well-integrated with existing commercial, service, and business uses, and that adverse visual, noise, odor, and/or traffic impacts are mitigated.
- **Goal LU 5: Natural Resources** - Ensure that future development minimizes its impact on natural resources, integrates natural features and views where possible and appropriate, and reduces environmental hazards for the Silverthorne community.
    - **Sites and Vegetation Policy LU 5.1** - Discourage development within, or adjacent to, areas identified as potential hazardous areas. Developments proposed for any areas considered to pose a hazard shall submit engineering investigations of the site and mitigate potential negative impacts.
    - **Site and Vegetation Policy LU 5.2** - Discourage the disturbance of slopes greater than 30% during development and require engineering investigations of steep sites during project review. Development on slopes in excess of 15% shall maintain the maximum vegetative cover possible to protect soils, prevent land slippage, and retain wildlife habitat and open space resources.
    - **Site and Vegetation Policy LU 5.3** - Encourage the paving of existing gravel roadways, driveways and parking lots to decrease pollution from erosion and dust.
    - **Water Quality, Wildlife Habitat and the Blue River Policy LU 5.9** - Require new and existing developments to provide adequate measures to control, manage, and minimize adverse effects on the water resources and water quality of the region. These include items such as water related treatment and management basins and/or plans for stormwater and water quality management.
    - **Wildfire Prevention and Mitigation Policy LU 5.15** - Work cooperatively with appropriate agencies on wildfire prevention and mitigation policies and programs, and explore efforts aimed at reducing wildfire risk within the Town

Silverthorne Town Code

The Silverthorne Town Code serves as the legal framework for the Town, codifying allowable activities and creating an enforcement structure for its adopted policy. The Town Code is organized into five chapters and various subsections; those related to hazard mitigation are outlined below.

Chapter 3 Public Works Article VIII Flood Damage Prevention Ordinance, 2018

The flood damage prevention ordinance was recently re-adopted via ordinance 1) to reflect FEMA DFIRM mapping effective dates, reflecting November 2018 effective dates, and 2) to incorporate new State mandated requirements, which are more stringent than the prior requirements. It is the purpose of this Article to promote public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- (1) Protect human life and health;
- (2) Minimize expenditure of public money for costly flood control projects;
- (3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- (4) Minimize prolonged business interruptions;
- (5) Minimize damage to critical facilities, infrastructure and other public facilities such as water, sewer and gas mains; electric and communications stations; and streets and bridges located in floodplains;
- (6) Help maintain a stable tax base by providing for the sound use and development of floodprone areas in such a manner as to minimize future flood blight areas; and
- (7) Ensure that potential buyers are notified that property is in a flood hazard area.

In order to accomplish its purposes, this Article uses the following methods:

- (1) Restrict or prohibit uses which are dangerous to health, safety or property in times of flood or cause excessive increases in flood heights or velocities;
- (2) Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- (3) Control the alteration of natural floodplains, stream channels and natural protective barriers, which are involved in the accommodation of flood waters;
- (4) Control filling, grading, dredging and other development which may increase flood damage; and
- (5) Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters, or which may increase flood hazards to other lands.

In all areas of special flood hazards where base flood elevation data has been provided, residential and nonresidential new construction and substantial improvement must have the lowest floor elevated to at least one foot above base flood elevation.

The ordinance designates the Public Works Director or his or her designee as the floodplain administrator and defines the administrator's duties.

Chapter 4 Community Development Article V Procedures and Requirements for Subdivisions

One of the purposes of this article is to promote the general health, safety, and welfare of the present and future inhabitants of the Town by requiring that land proposed for subdivision shall be used safely for the intended purpose without danger to health or peril from fire, flood, geologic hazards, or other natural hazards. It requires that no land shall be subdivided which is determined by the Town to be unsuitable for subdivision by reason of flooding, bad drainage, rock or soil creep, mudflow, rockslide, avalanche or snow slide, steep topography, or any other natural or environmental hazard, feature or condition of potential harm to the health, safety, or welfare of the future residents of the proposed subdivision or to the Town.

Chapter 4 Community Development Article VIII Environmental Guidelines

Division 5 Fire Hazard Mitigation establishes permitted fire mitigation standards for the protection of life and property from wildfires by reducing the hazards from threat of wildland fires on structures. Mitigation regulations include the following

- Roof material required.
    1. All new construction of residential and commercial structures shall be required to install a Class A roof covering.
    2. All existing residential and commercial structures when re-roofing will require a Class A roof cover to be installed.
- Vegetation/natural materials.
    1. A property owner may remove all trees and shrubs within 10 feet of structures on site.
    2. Tree branches of large trees should be trimmed to a minimum of six feet from the ground.
    3. Cut or piled combustible materials may be a minimum of 10 feet from the property line and/or 10 feet from any structure.
    4. Grass and/or other combustible materials on undeveloped parcels of any size which pose a fire hazard as determined by the Community Development Department or Lake Dillon Fire Department shall be removed.
    5. Dead, diseased and/or beetle infested trees must be removed from the property within 10 days of receipt of written notice to the property owner or responsible party.
- Chimney spark arrestors. Upon remodeling, renovation, or repairs requiring a building permit, the owners of the residential property will retrofit all existing wood stoves/wood burning fireplace chimneys with approved spark arrestors as approved by the building official.

Floodplain Regulations and NFIP Participation

Silverthorne joined the National Flood Insurance Program (NFIP) on May 1, 1980. There are Special Flood Hazard Areas identified in the most current (November 2018) Flood Insurance Study and associated National Flood Hazard Layer, for both the 1% and the 0.2% annual chance events. However, there are no repetitive loss or severe repetitive loss properties as defined by the NFIP. The Town Engineer in Public Works shares responsibilities related to flooding hazards such as acting as the floodplain administrator, and ensuring Town compliance with Federal, State, and local floodplain regulations. As previously stated, Chapter 3 of the Silverthorne Town Code also has flood damage prevention ordinance.

Silverthorne participates in the Community Rating System (CRS). The Town has, as of May 1, 2019, a CRS class ranking of 8, which provides a 10 percent reduction in flood insurance premiums for all policyholders in the community. Silverthorne achieves its CRS points through the following activities:

- Elevation certificates
- Map information service
- Hazard disclosure
- Higher regulatory standards
- Flood data maintenance
- Stormwater management
- Drainage system maintenance

Administrative/Technical Mitigation Capabilities

Table F-15 identifies the personnel responsible for activities related to mitigation in Silverthorne.

Table F-15 Administrative and Technical Mitigation Capabilities in Silverthorne

Personnel Resources	Yes/No	Department/Position
Planner/Engineer with Knowledge of Land Development/Land Management Practices	Yes	Community Development/Director; Planning Manager, Planner II
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	Yes	Public Works/Director, Engineer; Utilities Manager
Planner/Engineer/Scientist with an Understanding of Natural Hazards	Yes	Community Development; Public Works/Director, Engineer
Personnel Skilled In GIS	Yes	Public Works and Utilities Personnel; Community Development/Information Systems Technician
Full Time Building Official	No	Contracted through Summit County
Floodplain Manager	Yes	Public Works/Engineer
Emergency Manager	No	Summit County Office of Emergency Management/Emergency Manager
Grant Writer	Yes	Parks and Recreation/Director
Warning Systems/Services	Yes	Summit County Office of Emergency Management/Emergency Manager

Fiscal Mitigation Capabilities

Table F-16 identifies financial tools or resources that Silverthorne could potentially use to help fund mitigation activities.

Table F-16 Fiscal Mitigation Capabilities in Silverthorne

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
Fees for Water, Sewer, Gas, or Electric Services	Yes, water and sewer
Impact Fees for New Development	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activities	Yes
Withhold Spending in Hazard Prone Areas	Yes

Mitigation Outreach and Partnerships

Silverthorne is involved in ongoing outreach activities and partnerships related to hazard mitigation, which include the following:

- Each spring, the governments of Summit County, Breckenridge, Dillon, Frisco, and Silverthorne distribute a packet of information to inform the communities about how to prepare for possible high water in May or June resulting from snowmelt.
- After the December 2007 severe winter storm, the Town met with the Red Cross to improve guidelines and procedures for deploying an emergency shelter in the Silverthorne Recreation Center. Specific times of operation, capacity of the building, and capacity of each room within the building were determined. The Town will apply the new procedures during the next emergency event that requires sheltering.

Past Mitigation Efforts

Other mitigation related programs and projects that Silverthorne has implemented in the past include the following:

- In November 2007, a tree survey of public and private forested properties was conducted to help manage the mountain pine beetle infestation in Silverthorne. The survey identified 2,129 trees that needed to be cut and removed (or cut and chipped) before the summer of 2008. Property owners were responsible for taking action on trees on their property.
- In 2006, the Town hired a consultant to review all Town-owned property, including public rights of way, for beetle or other infestation killed trees. The Town then had the dead and downfall trees removed and preventive spraying applied to specified trees per the consultant's recommendations.
- The Town completed a stream restoration project on the Blue River to improve fish habitat and ecological function. This project also deepened the flow channel, which reduces flooding.
- Within the past 10 years, the Town has implemented an automatic backup power source for the Town's water supply system to insure an available water source during emergencies, such as a wildfire incident.
- Initiated in 2000 and continued annually, the Town provides a dropoff site for slash and processes the collected slash into chips that are transported to the Climax Mine as part of their reclamation efforts.

F.5 Opportunities for Enhancement

Based on the capability assessment, Silverthorne has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the Town to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM. Additional training opportunities will help to inform Town staff and board members on how best to integrate hazard information and mitigation projects into the Town policies and ongoing duties of the Town. Continuing to train Town staff on mitigation and the hazards that pose a risk to the Town will lead to more informed staff members who can better communicate this information to the public.

Another opportunity would be to improve the CRS rating; and an improved rating could make flood insurance more affordable. See related mitigation action #7 Floodplain mapping and management.

F.6 Mitigation Goals and Objectives

Silverthorne adopted the hazard mitigation goals and objectives developed by the Summit County Hazard Mitigation Planning Committee and described in Chapter 4 Mitigation Strategy.

F.7 Mitigation Actions

The planning team for Silverthorne identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included. The Town also chose to include emergency response actions related to water and wastewater facilities in their annex.

Continued Compliance with the National Flood Insurance Program.

As part of their mitigation strategy, Silverthorne will continue participation in and compliance with the NFIP. Specific activities that the Town will undertake to continue compliance include the following:

- Continuing participation in the Community Rating System and identifying opportunities to increase points and lower rating, such as through this planning process
- The Town will let the Insurance Services Office (ISO) know that this plan exists, is updated, and conforms with DMA, FMA and CRS planning requirements so that credit can be considered during the next CRS review.
- A mitigation action was introduced in 2013 related to Floodplain Mapping and Management (see Action #7).

Mitigation Action: Silverthorne—2 Mountain Pine Beetle Ordinance

Jurisdiction: Town of Silverthorne

Action Title: Continue to implement mountain pine beetle program and enforce ordinance

Hazard(s) Mitigated Pest Infestation (forest)

Priority: High

Issue/Background Silverthorne's Code Section 4-8-44 (adopted in 2006) requires landowners to remove all dead, diseased, and/or beetle-infested trees located on their property within 10 days of notification. In November 2007, a tree survey of public and private forested properties was conducted to help manage the mountain pine beetle infestation in Silverthorne. The survey identified 2,129 trees that needed to be cut and removed (or cut and chipped) before the summer of 2008. Landowners were responsible for taking action on trees on their property. The tree removal deadline was June 20, 2008, and enforcement measures for remaining trees began in July 2008.

The Town also has removed beetle infested trees from Town-owned property at a cost of approximately $50,000 in 2007 and $70,000 in 2008.

Ideas for Implementation: Silverthorne will continue with program for the next three to five years Between September 20 and October 1, 2008, the Town will survey trees on residential properties in Silverthorne to identify and mark trees that have been recently infected with pine beetle. These trees will be marked with a blue paint ring. Upon the completion of the survey, property owners with infected or dead trees on their property will receive a follow-up notification indicating removal requirements. The Town will also conduct media outreach to inform property owners of the program. Trees that have not been removed by the stated deadline will be removed by the Town and property owners charged at double the full cost of removal plus additional fines. The Town will offer a site for citizens to take slash for disposal and will pay for grinding at the end of the year.

Responsible Agency: Silverthorne Town Manager's office and Community Development Department

Partners: All Town departments

Potential Funding: The Town of Silverthorne will provide funding for the tree survey, slash disposal site and grinding, and staff time to administer and enforce program. Property owners pay for tree removal.

Cost Estimate: Annual cost estimate is $7,000-10,000 for tree survey, $10,000 for slash disposal site and grinding, $50,000 for tree removal on Town-owned property, and significant staff time to administer and enforce

Benefits: (Losses Avoided)

- Reduces wildfire hazard
- Reduces rate of spread of mountain pine beetle infestation

Timeline:

Status: **Completed.**

Mitigation Action: Silverthorne—3 Emergency Power for Wastewater Treatment Plant

Jurisdiction:	Town of Silverthorne
Action Title:	Insure emergency power for wastewater treatment plant during extended power outage
Hazard(s) Mitigated	Multi-Hazard
Priority:	Medium
Issue/Background	A 450-kilowatt emergency generator was installed in 2000. The generator consumes approximately 33 gallons of diesel per hour. The fuel is supplied from a 1,000-gallon tank which would require refilling on a daily basis during an extended power outage. Possible solutions are to arrange for the delivery of a tanker during an emergency.
Ideas for Implementation:	Evaluate increasing emergency generator capacity to reflect plant expansions and increased plant loading since the generator was installed in 2000. The generator is capable of running the main plant and digestor but would require that aeration be cycled to various basins on a rotating basis since the generator cannot operate all of the required blowers on a continuous basis. The dewatering facility is on a separate transformer and cannot be operated by the emergency generator. If it became necessary to operate the centrifuge during an extended power outage, a 150 kilowatt generator could be rented. Availability and guaranteed rental should be investigated. The flow equalization pond provides additional backup during an extended power failure. Approximately 24 hours of partially treated wastewater could be stored in the pond on an emergency basis. An engineering evaluation for installing increased generator capacity should be initiated.
Responsible Agency:	Silverthorne/Dillon Joint Sewer Authority
Partners:	Town of Silverthorne and Town of Dillon
Potential Funding:	Capital funding
Cost Estimate:	Costs will be estimated based upon engineering evaluation
Benefits: (Losses Avoided)	• Prevent loss of services during extended power outages • Avoid discharging raw wastewater and associated violations and possible penalties
Timeline:	Generator capacity engineering study and design in 2010 with capital appropriation and construction in 2012.
Status:	**Completed.**

Mitigation Action: Silverthorne—4 Emergency Power for Water Distribution

Jurisdiction: Town of Silverthorne

Action Title: Ensure continued water distribution during extended power outage

Hazard(s) Mitigated Multi-Hazard

Priority: Medium

Issue/Background The Water and Sewer program maintains the Town's water system and sewage transmission line. Water is provided by the Town of Silverthorne through a system of wells, storage tanks, and distribution lines. Some emergency power generators are in place, but additional generators and fuel sources are needed to maintain services during extended power outages.

Ideas for Implementation: Secure fuel source for generators in place. Verify rental companies can accommodate our needs. Budget for a mobile generator to run all stations.

Responsible Agency: Silverthorne Public Works Department – Water and Sewer program

Partners:

Potential Funding: Town of Silverthorne

Cost Estimate: $50,000

Benefits: (Losses Avoided)

- Prevent interruption of fire flows
- Prevent loss of services to customers
- Protection public health and safety

Timeline:

Status: **Completed**.

Mitigation Action: Silverthorne—5 Action Plan for Explosive Gas Event

Jurisdiction:	Town of Silverthorne
Action Title:	Develop action plan for responding to an explosive gas event at the headworks of the Silverthorne/Dillon Joint Sewer Authority
Hazard(s) Mitigated	HazMat
Priority:	Low
Issue/Background	Explosive gas detectors are located at the head works and the Buffalo Mountain and the Dillon/Dillon Valley flume vaults. An alarm is triggered at the head works when an explosive gas concentration reaches 10 percent lower explosive limit. The overhead door opens automatically, and an exhaust fan turns on.
Ideas for Implementation:	If the alarm persists, plant personnel should be notified and assemble at the sludge building. The plant gate should be locked to prevent entry by non-essential personnel. The fire and police departments should be notified of the situation and placed on standby. If an explosion were to occur and damage or destroy the head works, it would be necessary to establish bypass pumping using the Silverthorne/Dillon Joint Sewer Authority's 4x4 and 6x6 trash pumps. The damage could extend up the sewer line for some distance and an additional discharge hose might be required. Extended time pumping would require additional pumps be rented. Refer to the JSA ERP located in the Lab at the JSA Treatment Plant
Responsible Agency:	Silverthorne/Dillon Joint Sewer Authority
Partners:	Rain For Rent Pump Rental Activate CoWARN & Request Assistance
Potential Funding:	Purchase bypass pump with 2,000 GPM capacity
Cost Estimate:	$75,000
Benefits: (Losses Avoided)	Prevent loss of services, continue plant operations and meet discharge permit
Timeline:	Purchased in 2015.
Status:	**Completed.**

Mitigation Action: Silverthorne—6 Cottonwood Shared Facilities

Jurisdiction:	Town of Silverthorne
Action Title:	Cottonwood shared Silverthorne Public Works and Summit Fire & EMS Facilities
Hazard(s) Mitigated	Wildfire
Priority:	Medium
Issue/Background	Silverthorne owns a parcel of land towards the north end of Town that was a required land dedication from the developers of the Eagles Nest subdivision region in the 1980's. A portion of this land was earmarked as the site of a potential future fire station. In more recent years, the Town and Summit Fire & EMS have been working together on developing and acquiring approvals for a site plan that would include sites for both a future public works building and a future fire station building. The facilities would be located adjacent to each other and would share some common items such as utility and access infrastructure; however, the buildings themselves would be built, owned and maintained separately by each respective entity.
Ideas for Implementation:	The site plan and infrastructure has already been designed and approved. Funding is what is needed for construction to occur.
Responsible Agency:	Town of Silverthorne /Summit Fire & EMS Protection District
Partners:	Town and Fire Protection District departments, employees and officials
Potential Funding:	DOLA Grants and through the normal Capital planning and budget processes,
Cost Estimate:	Approximately $7 million for both projects and shared site work
Benefits: (Losses Avoided)	Summit Fire & EMS' closest staffed fire facility is located in Dillon. A new location in Silverthorne would result in closer proximity to most if not all of Silverthorne residents, development and infrastructure and would likely result in quicker response times. Silverthorne's Public Works staff would benefit from larger, more efficient offices and vehicle storage and maintenance facilities.
Timeline:	Silverthorne Public Works Building is anticipated for 2015 or 2016. The timeframe for Summit Fire & EMS is unknown/uncertain.
Status:	**Completed.** Action added in 2013

Mitigation Action: Silverthorne—7 Floodplain Mapping and Management

Jurisdiction: Town of Silverthorne
Action Title: Floodplain mapping and management
Hazard(s) Mitigated Flood

Priority: Medium
Issue/Background There are several components:

1) Community Rating System (CRS) update. Silverthorne participates in the CRS, which is a point based incentive program, whereby properties within Silverthorne may receive a percentage based discount on flood insurance premiums. This discount rate is based on points earned within the CRS program. FEMA updated the CRS program guidance in 2013. The Town of Silverthorne may consider updating and expanding our local administration of the CRS program as well. The goal would be to earn more points so that flood insurance premium discounts can be increased. Points reflect effort done for both education and awareness as well as for proper planning for land uses in or near a floodplain.

2) Recreational In Channel Diversion (RICD) projects. The Town has considered building a kayak park at some point in time in the future. While the primary function is that of recreation, such a river project may improve the function of the river and mitigate potential flood hazards. The park will need increased flows, controlled by Denver Water, to function effectively. Silverthorne will request for a greater number of annual days with higher volumes of flows. As a beneficial byproduct, these higher flows will better transport and/or clear up areas of sedimentation and partial blockages or restrictions where they may exist along the length of the river. A better flowing, less congested river will reduce the level of future flood potential.

Ideas for Implementation: See above for descriptive detail.

Bullet points include:

- Improved mapping for land use presentation and analysis
- Improved floodplain management via CRS and other means
- Planning and construction of river related projects.

Responsible Agency: Town of Silverthorne Public Works; Public Works Director or designee

Partners: Town of Silverthorne. Possibly also FEMA and Colorado Water Conservation Board (CWCB – the State)

Potential Funding: FEMA, CWCB. Town budgeting. Possible future grants.

Cost Estimate: $5,000 to $100,000

Benefits: (Losses Avoided) Reduce risk and/or extent of damage to property. Reduce risk of threat to health and safety to people. Reduced cost of flood insurance to residents through CRS participation and enhancement.

Timeline: Ongoing

Status: Ongoing. Action added in 2013

Mitigation Action: Silverthorne—8 Community Evacuation

Jurisdiction:	Town of Silverthorne
Action Title:	Community evacuation
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background	Develop procedures to quickly, efficiently and effectually evacuate critically identified areas of the community.
Ideas for Implementation:	Update the Town's current evacuation plan, look into advanced mapping programs to allow real-time updates, research other towns and their evacuation plans.
Responsible Agency:	Silverthorne Police Department
Partners:	Summit County and Municipalities
Potential Funding:	State OEM; general fund
Cost Estimate:	$5,000 to $25,000
Benefits: (Losses Avoided)	Have an orderly evacuation where all residents are able to leave their homes safely without loss of life.
Timeline:	Ongoing
Status:	Ongoing. Action added in 2013

Mitigation Action: Silverthorne—9 Firewise Education

Jurisdiction:	Town of Silverthorne
Action Title:	Firewise Education
Hazard(s) Mitigated	Wildfire
Priority:	Medium
Issue/Background	Summit County has experienced wildfires near the Silverthorne area in recent years and proper wildfire mitigation practices has proven successful in saving property and lives. This action would provide education on fire wise practices to any property that is applying for a building permit. Both new construction and remodel work will receive the educational materials.
Ideas for Implementation:	Educational pamphlets and information will be provided through the Community Development Department during the building permit process
Responsible Agency:	Silverthorne Community Development Department
Partners:	Summit County
Potential Funding:	General Fund
Cost Estimate:	$2,000
Benefits: (Losses Avoided)	Prevent property damage and save lives.
Timeline:	Start in 2020 and ongoing
Status:	New in 2020. Ongoing.

Mitigation Action: Silverthorne—10 Reinforce River Banks

Jurisdiction:	Town of Silverthorne
Action Title:	Reinforce River Banks to prevent flooding onto private property.
Hazard(s) Mitigated	Flood, Dam Incident, erosion
Priority:	High
Issue/Background	During high flows usually associated with floods or high releases from Dillion Reservoir the Blue River begins to erode the river banks at some isolated locations next to private property. The erosion will damage private property if left unchecked. The erosion does not cause debris flow but instead destroys the adjacent properties and makes them unusable.
Ideas for Implementation:	Design and construct armament along the banks of the Blue River in those isolated areas so that the banks remain in the current location.
Responsible Agency:	Town of Silverthorne Public Works
Partners:	Army Corps of Engineers
Potential Funding:	Grants from Federal Government and State of Colorado, Town of Silverthorne General Fund.
Cost Estimate:	$150,000
Benefits: (Losses Avoided)	Avoid loss of property value.
Timeline:	Design in 2021 and construct in 2022.
Status:	New in 2020.

F.8 Implementation and Maintenance

Moving forward, the Town will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

F.8.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Town to help inform updates and the development of local plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

Risk and vulnerability information the 2013 Summit County Hazard Mitigation Plan and the Town of Silverthorne annex was used to inform the 2014 update to the Town of Silverthorne Comprehensive Plan and updates to the Town Code, as noted in section F.4 Capability Assessment. Refer to subsection Regulatory Mitigation Capabilities for more information related to the integration into the Town's Code.

Process Moving Forward

Moving forward, the Engineering Division may utilize the hazard information when implementing the Town's Capital Improvement Plan and the Planning and Zoning Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The Town will also incorporate this HMP into future updates to the Town of Silverthorne Comprehensive Plan.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Silverthorne will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

F.8.2 Monitoring, Evaluation and Updating the Plan

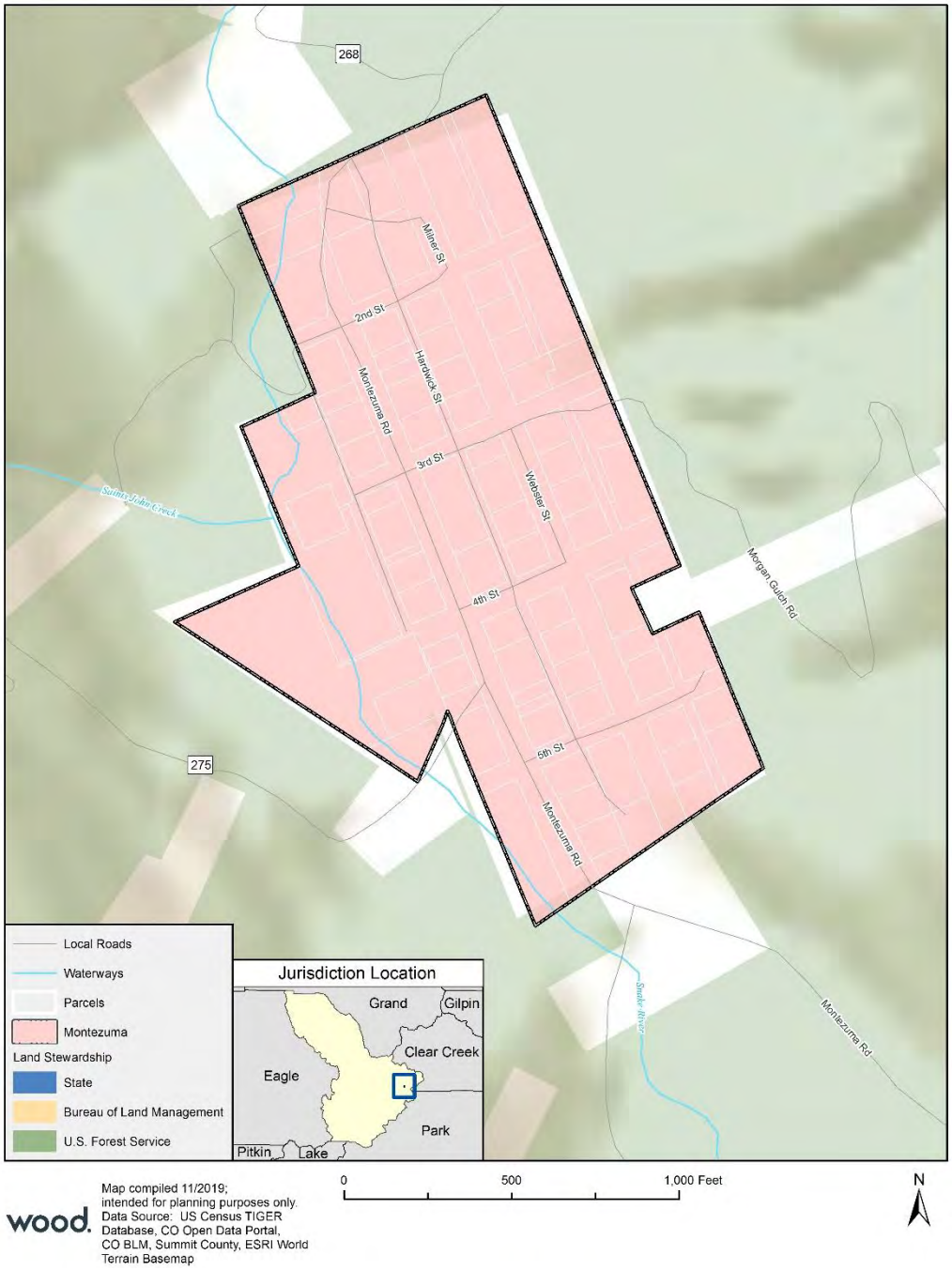
The Town will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The Town will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The Director of Public Works will be responsible for representing the Town in the County HMPC, and for coordination with Town staff and departments during plan updates. The Town realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

Annex G: TOWN OF MONTEZUMA

G.1 Community Profile

Figure G-1 shows a map of the Town of Montezuma and its location within Summit County.

Figure G-1 Map of Montezuma



G.1.1 Geography

The Town of Montezuma has a total area of just under 0.1 square miles. It is located in eastern Summit County at an elevation of 10,200 feet above sea level in the upper valley of the Snake River. The Town is surrounded by peaks that reach 12,000-13,000 feet in elevation.

G.1.2 Population

The estimated 2018 population of Montezuma was 68. Select U.S. Census data, American Community Survey (ACS) 2013-2017 estimates, and Colorado's State Demography Office statistics of demographic and social characteristics for the town are summarized in Table G-1 below.

Table G-1 Montezuma Demographic and Social Characteristics 2012-2017

Characteristic	2013-2017 Estimate
Gender/Age	
Male	66.7%
Female	33.3%
Under 5 Years	0%
65 Years and Over	0%
Median Age	30.8
Race/Ethnicity (one race)	
White	100%
Black or African American	0%
Asian	0%
Native Hawaiian and Other Pacific Islander	0%
Other	0%
Hispanic or Latino (Of Any Race)	0%
Other	
Average Household Size	2.56
High School Graduate or Higher	100%

Source: ACS 2013-2017; US Census (factfinder.census.gov); State Demography Office 2017

G.1.3 History

The Town of Montezuma was founded in 1865 as a prospecting town when silver was discovered near Argentine Pass. It was incorporated in 1881. The Town continued to grow during Colorado's silver rush, reaching a population of roughly 1,000 people in 1890. A few short years later the Town's population declined sharply with the Silver Bust. With the exception of a slight mining revival in the 1940s, the Town has remained quiet with a small population. Nowadays, Montezuma is often referred to as a "ghost town" given the relatively small number of year-round residents and plenty of uninhabited buildings, while a significant percentage of the population is composed of tourists.

G.1.4 Economy

The Town of Montezuma is a residential community with little industry or commercial business. According to ACS estimates, the industries that employed the highest percentages of Montezuma's labor force were

arts, entertainment, recreation, accommodation, and food services. Select economic characteristics for Montezuma from the 2013-2017 ACS estimates, U.S. Census Bureau, and Colorado's State Demography Office are summarized in Table G-2.

Table G-2 Montezuma Economic Characteristics

Characteristic	2013-2017 Estimates
Population with Income Lower than the Poverty Line	5.1%
Median Home Value	$600,000
Median Household Income	$60,000
Per Capita Income	$27,303
Population Employed	72%

Source: ACS 2013-2017; US Census (factfinder.census.gov); State Demography Office 2017

G.2 Hazard Identification and Profiles

Montezuma's HMPC identified the hazards that affect the community and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and overall significance specific to the Town (see Table G-3). In the context of the countywide planning area, there are no hazards that are unique to Montezuma.

Table G-3 Montezuma Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Occasional	Limited	Low
Dam Failure	Isolated	Unlikely	Negligible	Low
Drought	Large	Likely	Limited	Medium
Earthquake	Large	Occasional	Limited	Low
Erosion/Deposition	Isolated	Likely	Limited	Low
Flood	Small	Likely	Limited	Medium
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Negligible	Low
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Occasional	Limited	Medium
Lightning	Large	Highly Likely	Critical	Medium
Pest Infestation (Forest and Aquatic)	Isolated	Likely	Limited	Medium
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Highly Likely	Catastrophic	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Medium	Likely	Limited	Low

Note: See Section 3.2 of the main HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

G.3 Vulnerability Assessment

The intent of this section is to assess Montezuma's vulnerability separate from that of the planning area (i.e. Summit County) as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment

of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk to hazards for the more significant hazards or where available data permitted. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the main plan HIRA document.

G.3.1 Community Asset Inventory

Table G-4 shows the total number of improved parcels, properties, and their improvement and content values for the Town of Montezuma. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, and 0% for Exempt and Vacant parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table G-4 Montezuma Improved Parcel and Property Exposure

Parcel Type	Parcel Totals	Total Properties*	Improved Value	Content Value	Total Value
Exempt	11	11	$0	--	$0
Residential	47	53	$20,992,507	$10,496,254	$31,488,761
Vacant	1	1	$518	--	$518
Total	**59**	**65**	**$20,993,025**	**$10,496,254**	**$31,489,279**

Source: Summit County Assessors Data, November 2019.
*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table G-5 lists summary information about the one critical facility identified by Montezuma's HMPC as important to protect or provide critical services in the event of a disaster. This single facility was considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, to estimate whether it might be at risk of the various hazards assessed. Figure G-2 displays the facility in the context of Montezuma. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the main plan HIRA document.

Table G-5 Montezuma Critical Facility Summary

FEMA Lifeline Category	Critical Facility Type	Facility Name	Facility Location
Safety and Security	Government Buildings	Montezuma Town Hall	5465 Hardwick St

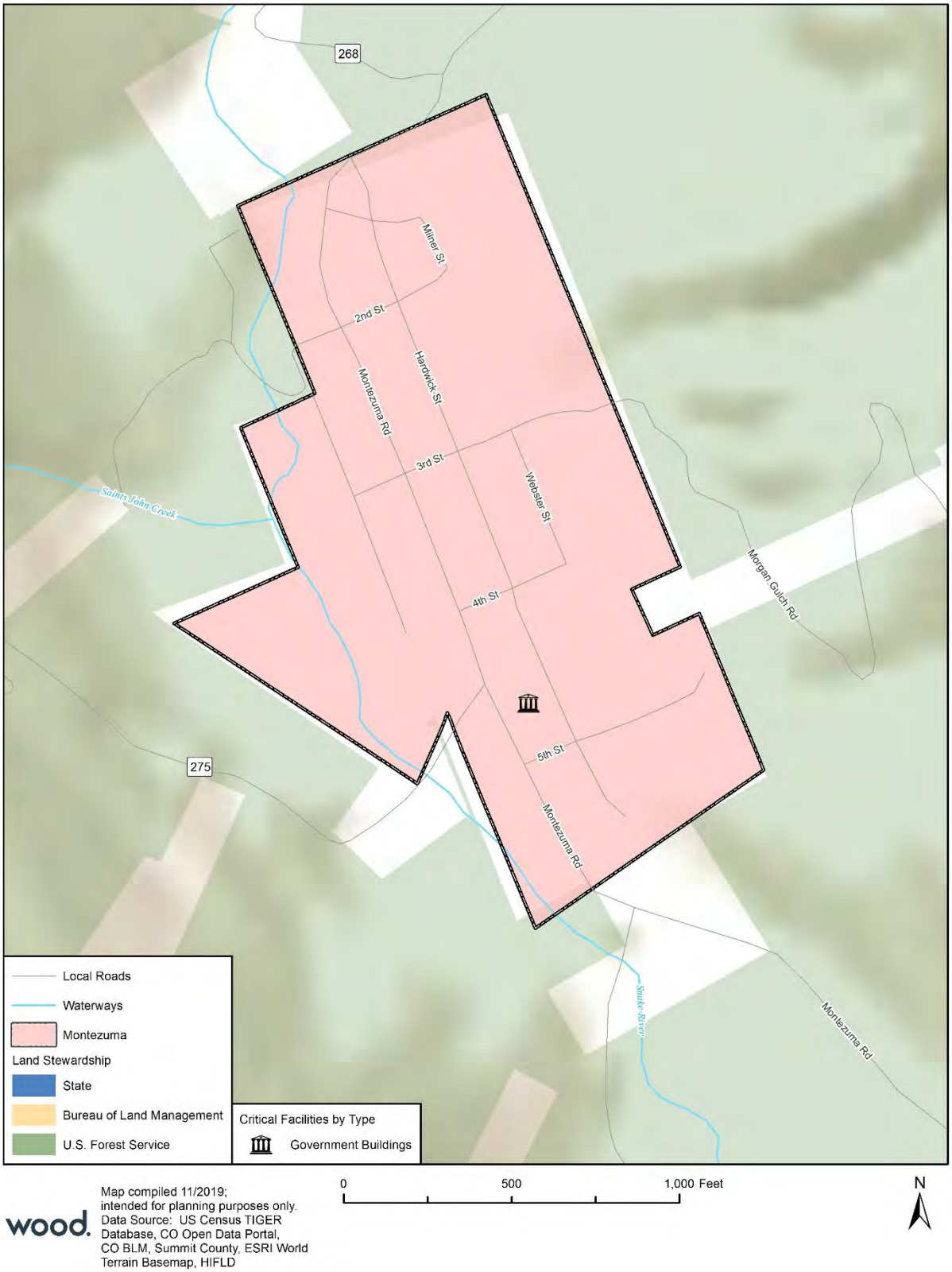
Source: Summit County GIS, Summit County HMPC.

The HMPC noted, in addition, the following critical facility and other community asset replacement values.

- Water Tank: $300,000 (vulnerable to freezing and flooding)
- Town Hall: $100,000 (flammable structure)

- Historic School House: $150,000 (flammable structure)
- Fire Hydrants: $65,000 (vulnerable to freezing)
- Culverts: $120,000 (vulnerable to freezing and flooding)
- Hardwick Street Bridge: $10,000 (vulnerable to flooding and erosion)

Figure G-2 Critical Facility in Montezuma



G.3.2 Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan.

- Drought
- Earthquake
- Erosion/Deposition
- Hazardous Materials (Transportation)
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Only Flood, Landslide/Mudflow/Debris Flow/Rockfall, and Wildfire hazards will be profiled in the following vulnerability assessment sections, due to the ability to quantify vulnerability further with available data.

Flood

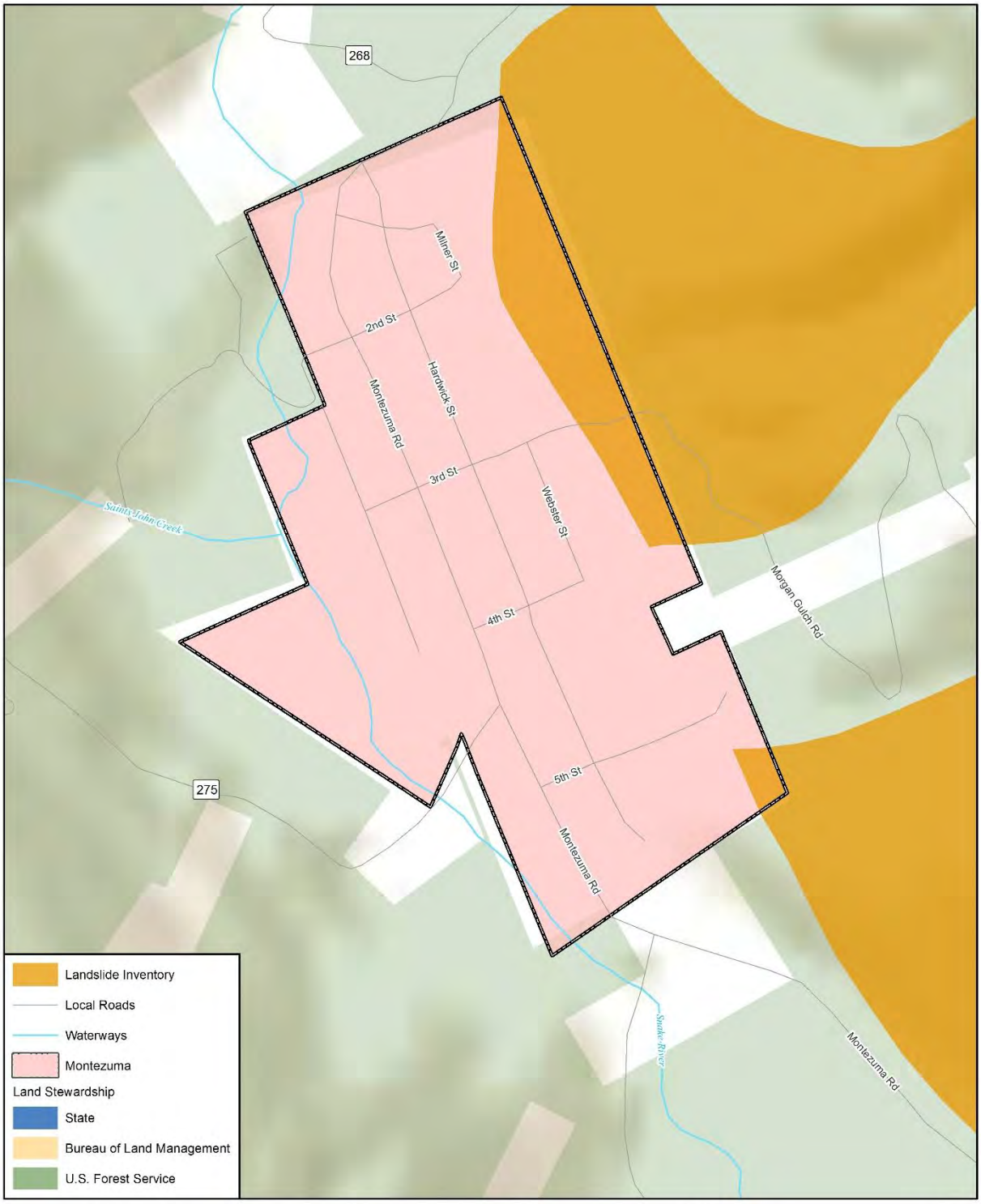
Although there are no FEMA Special Flood Hazard Areas mapped in the community, there was a major event in 2014 which affected the town and its residents (CBS Denver 2014). The Town of Montezuma suffered major road and infrastructure washouts due to flooding which began on the 3rd of June. Flood waters from the Snake River destroyed the main road to the town (Montezuma Road), clogging a culvert and leading to the road being washed out. An estimated 20 residents were stranded for days due to the washout. A new bridge was installed to replace the 60 inch culvert which failed, which restored access to and from Montezuma and should mitigate future events.

Landslide, Mudflow/Debris Flow, Rockfall

General Property

A small portion of the Montezuma community is located in areas that have limited potential for landslide, mudflow, debris flow, or rockfall hazards. These are found on the easternmost areas of the town, on the north-northwest and south-southeast of Morgan Gulch Road, and east of Montezuma Road. Figure G-3 below displays these general landslide potential hazard areas.

Figure G-3 Landslide Hazard Areas in Montezuma



Map compiled 11/2019; intended for planning purposes only. Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, Summit County, ESRI World Terrain Basemap, CGS

Potential losses for general landslide areas were estimated using Summit County GIS and assessor's parcel data. Based on the GIS analysis performed, the potential risk to general landslide areas in Montezuma is summarized in Table G-6. For the purposes of this analysis, if a parcel's centroid intersected the landslide hazard polygons, that parcel is assumed to be at risk.

Montezuma's property exposure has a total value of over $1.3 million, based on Residential and Exempt properties. A total of 5 properties are exposed to landslide hazards.

Table G-6 Property Exposure to General Landslide Areas in Montezuma

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Residential	2	$885,825	$442,913	$1,328,738	6
Exempt	3	$0	--	$0	--
TOTAL	**5**	**$885,825**	**$442,913**	**$1,328,738**	**6**

Source: Summit County GIS/Assessor Office, Colorado Geological Survey, U.S. Census, Wood analysis

People

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways. Based on Table G-6 above, an estimated 6 people could be at risk of general landslide hazards in Montezuma. At risk population was estimated by multiplying the average number of persons living in each household in Summit County (which is 3.1 per home) times the number of properties of type "residential" where landslide areas have been inventoried in Montezuma.

Critical Facilities and Infrastructure

No critical facilities are found at risk of landslide hazards in Montezuma. However, transportation routes present in or nearby the town can be considered key infrastructure allowing access in and out of it and could be at risk of this and related geologic hazards (rockfall, mudslide, and debris fall). If closures were required along these critical routes for Montezuma (e.g. Montezuma Road/CR 5, CR 275, CR 264), normal flow of goods and services might be hindered, for example.

Economy

Given that the economy of the Town is limited, it is not anticipated that landslides would have much economic impact.

Historical, Cultural, and Natural Resources

As primarily natural processes, landslides and debris flows can have varying impacts to the natural environment as well as cultural or historical resources found on their path. For buildings and other structures, impacts would be similar as those seen on general property or critical facilities/infrastructure.

Future Development

Future development will benefit from the safest infrastructure, even in smaller communities like Montezuma. Based on the recent trend with limited population and overall growth in Montezuma, it is not expected that future development will be significantly impacted by landslide or related geologic hazards

as long as it is conducted following land use, building, and other appropriate codes and engineering standards.

Wildfire

General Property

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which classifies areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in Breckenridge. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. From the improvement values were. Property improvements and estimated content values were then totaled to arrive at the Total Value column, which is also the estimated potential loss as wildfires typically result in complete loss to structure and contents.

Wildfire protection assessment areas for Montezuma are displayed in Figure G-4 for reference. This map shows that the majority of the town is located in Medium and High rating wildfire protection assessment areas, with portions in the southwest corner being covered by Extreme rating wildfire areas. A very small portion near the northeast corner of the town is found in the Low rating wildfire area, east of Milner Street.

Figure G-4 Wildfire Protection Assessment Areas and Ratings in Montezuma

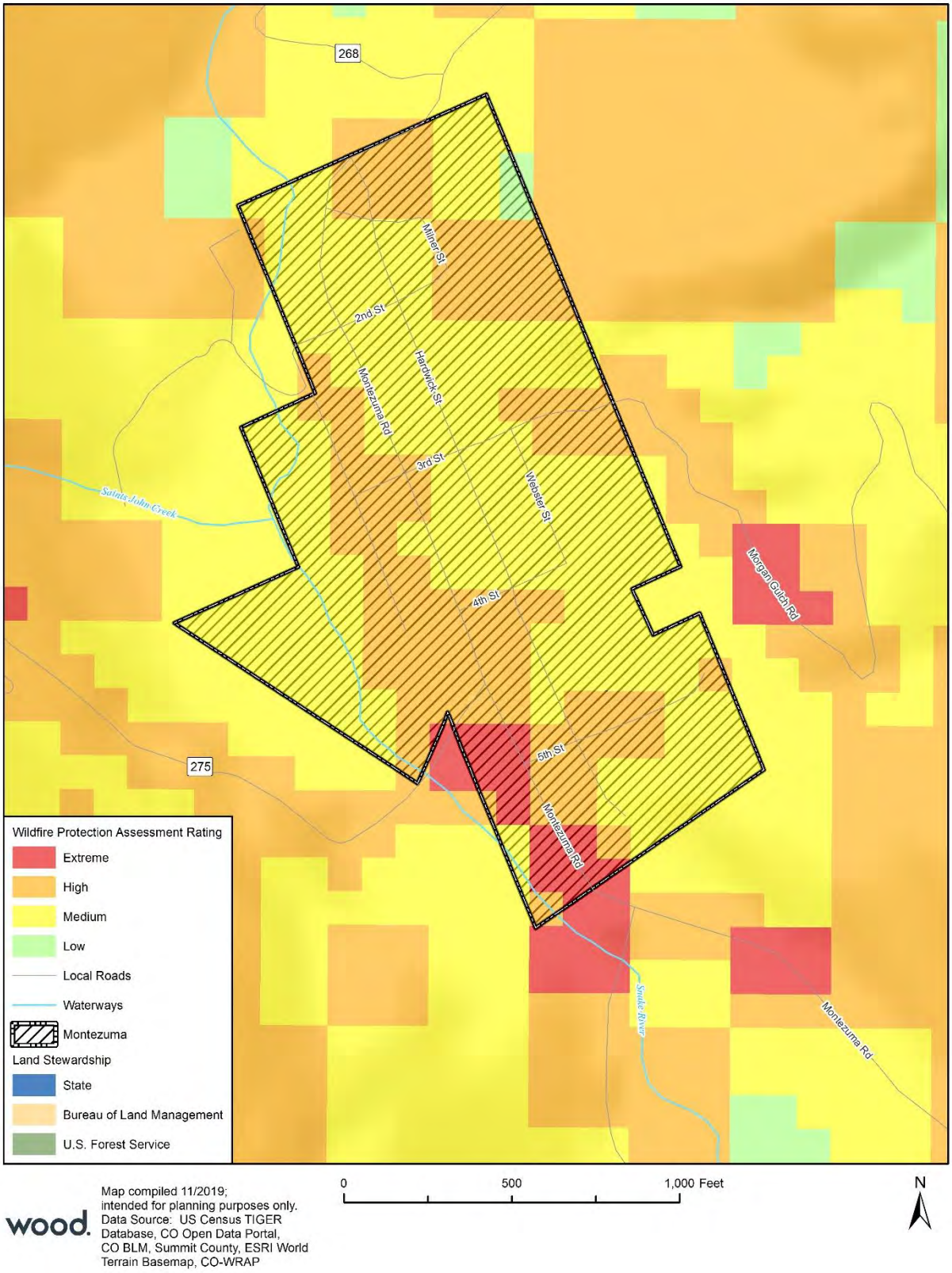


Table G-7 Property Values in Wildfire Zones by Parcel Type – Montezuma

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population at Risk
Exempt	4	$0	--	$0	--
Residential	53	$20,992,507	$10,496,254	$31,488,761	164
Vacant	1	$518	--	$518	--
TOTAL	**58**	**$20,993,025**	**$10,496,254**	**$31,489,279**	**164**

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis

People

The last column of Table G-7 above summarizes the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted, Montezuma could have an estimated 164 people at risk of Medium, High, and Extreme rated wildfire zones. These totals were estimated by multiplying the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire threat zone/s. Note that the actual population of the town is lower, estimated to be around 68 as of 2018, but the potential that all properties would be inhabited in summer times when tourist is usually higher, could still make the threat of 164 exposed people very possible (i.e. visitors staying in vacation homes).

Smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

The Montezuma Town Hall, the only critical facility found within Montezuma's boundaries, was found to be located in a High rating wildfire protection assessment area. This facility is classified under the Safety and Security FEMA lifeline.

Economy

Given that the economy of the Town is limited, it is not anticipated that wildfires would have much economic impact.

Historical, Cultural, and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after the fire.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important historical assets in Montezuma. The Montezuma Schoolhouse, the only historical asset noted in the National Register of Historic Places for the town, is located in a Medium rating wildfire protection assessment area, meaning it's at moderate risk of this hazard.

Future Development

The Town of Montezuma does not currently have any development regulations related to wildfire mitigation. The Town pursued grant funding to install additional hydrants in 2014. See Montezuma Mitigation Action 1 for further details.

G.3.3 Growth and Development Trends

Table G-8 summarizes how Montezuma has grown in terms of population and number of housing units between 2011 and 2017, based on Colorado's State Demography Office figures.

Table G-8 Change in Population and Housing Units in Montezuma, 2011-2017/2018

2011 Population	2018 Population	Population Percent Change 2011-2018	2011 Total Housing Units	2017 Total Housing Units	Housing Units Percent Change 2011-2017
77	68	-11.7%	47	55	17%

Source: Colorado Demography Office, 2017; American Community Survey (ACS) estimates, 2018

Over the past ten years, Montezuma's permanent resident population has remained small, yet it has experienced bursts of small increases. For example, the population in 2000 was 42 full-time residents and in 2010 there were 65 full-time residents. However, as of the 2018 American Community Survey (ACS) estimates, Montezuma only increased its population by 3 residents. It is unlikely that Montezuma will experience major increases in population or development in the next five years, based on historical evidence.

G.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into four sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

G.4.1 Regulatory Mitigation Capabilities

Table G-9 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Montezuma.

Table G-9 Regulatory Mitigation Capabilities in Montezuma

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	No	
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Growth Management Ordinance	Yes	
Floodplain Ordinance	No	
Other Special Purpose Ordinance	No	
Building Code	Yes	Town of Montezuma uses Summit County Building Code
Fire Department ISO Rating	10	
Erosion or Sediment Control Program	No	
Stormwater Management Program	No	
Site Plan Review Requirements	Yes	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Other Special Plans	No	
Flood Insurance Study or Other Engineering Study for Streams	No	
Elevation certificates (for floodplain development)	No	

Floodplain Regulations and NFIP Participation

Montezuma does not have any FEMA Special Flood Hazard Areas identified in the latest National Flood Hazard Layer, and does not currently participate in the NFIP, nor is it required to.

G.4.2 Administrative/Technical Mitigation Capabilities

Table G-10 identifies the personnel responsible for activities related to mitigation and loss prevention in Montezuma.

Table G-10 Montezuma's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with Knowledge of Land Development/Land Management Practices	No		
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	No		Summit County Building Department
Planner/Engineer/Scientist with an Understanding of Natural Hazards	No		Summit County
Personnel Skilled in GIS	No		Summit County GIS department
Full Time Building Official	No		Summit County Building Department
Floodplain Manager	No		

Personnel Resources	Yes/No	Department/Position	Comments
Emergency Manager	No		Summit County Department of Emergency Management
Grant Writer	No		Volunteer Town Trustees and Mayor
Other Personnel	Yes	Town Clerk	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No		Summit County
Warning Systems/Services	Yes, limited		Summit County Department of Emergency Management
Other	Yes		Town Trustees (all volunteer)

G.4.3 Fiscal Mitigation Capabilities

Table G-11 identifies financial tools or resources that Montezuma could potentially use to help fund mitigation activities.

Table G-11 Montezuma's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	No	
Capital Improvements Project Funding	No	
Authority to Levy Taxes for Specific Purposes	No	
Fees for Water, Sewer, Gas, or Electric Services	No	
Impact Fees for New Development	No	
Incur Debt through General Obligation Bonds	No	
Incur Debt through Special Tax Bonds	No	
Incur Debt through Private Activities	No	
Withhold Spending in Hazard Prone Areas	No	

G.4.4 Mitigation Outreach and Partnerships

The Town of Montezuma has engaged in wildfire specific emergency planning with the Summit County Department of Emergency Management.

G.4.5 Opportunities for Enhancement

Based on the capability assessment, Montezuma has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the Town to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM. Additional training opportunities will help to inform Town staff and board members on how best to integrate hazard information and mitigation projects into the Town policies and ongoing duties of the Town. Continuing to train Town staff on mitigation and the hazards that pose a risk to the Town will lead to more informed staff members who can better communicate this information to the public.

G.5 Mitigation Goals and Objectives

Montezuma adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

G.6 Mitigation Actions

The planning team for Montezuma identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: Montezuma—1 Fire Protection/Hydrant Install

Jurisdiction:	Town of Montezuma
Action Title:	Fire protection/hydrant installation
Hazard(s) Mitigated	Wildfire
Priority:	High
Background/Issue:	The Town of Montezuma has experienced several wildfires and structural fires since the 1940s, including two structural fires within the last five years. A hydrant system that was originally installed in 2008 is not yet complete. The number of hydrants needs to be increased to improve the Town's water supply for firefighting.
Ideas for Implementation	Install one or two additional fire hydrants in the Town of Montezuma. Hydrants would complete hydrant system installed in 2008. Two structure fires have occurred in the town over the last five years. The additional hydrants would improve firefighting capacity and provide a better method than the Town uses currently, to maintain flows from the water tank to the hydrants in the winter months.
Responsible Agency:	Town of Montezuma Mayor and Town Trustees
Partners:	Potential partners include Lake Dillon Fire and Rescue, Summit County, CO Department of Local Affairs, USFS
Potential Funding:	TBD (CO Department of Local Affairs has helped previously)
Cost Estimate:	$35,000
Benefits: (Losses Avoided)	Additional fire fighting capacity in the Town and improved winter maintenance capacity for the Town's water tank and hydrant system. Increased fire fighting capacity would be critical for successfully extinguishing structure fires within the Town boundaries as well as defending the town in the case of wildfire.
Timeline:	2014
Status:	Action added in 2013

Mitigation Action: Montezuma—2 Drainage Plan Implementation

Jurisdiction:	Town of Montezuma
Action Title:	Drainage plan implementation
Hazard(s) Mitigated	Flood
Priority:	High
Background/Issue:	In 2011 the Town of Montezuma hired a professional engineer to analyze the Town's drainage issues and provide a plan to update and improve drainage through and along the Town streets. The plan is complete, and the Town would like to implement some of the engineer's recommendations.
Ideas for Implementation:	1. Update (if necessary) the Town's drainage engineering plans completed in 2012. 2. Implement the engineering recommendations.
Responsible Agency:	Town of Montezuma
Partners:	Potential partners include Summit County, CO Department of Local Affairs.
Potential Funding:	TBD
Cost Estimate:	$100,000
Benefits: (Losses Avoided)	A professionally designed and professionally constructed drainage system would reduce the amount of road maintenance, reduces the risk of property damage in Town, reduce sedimentation that reaches the Snake River, and improve the reliability of roadways for emergency responders and Summit County Road Maintenance.
Timeline:	2014 and ongoing.
Status:	Action added in 2013

G.7 Implementation and Maintenance

Moving forward, the Town will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

G.7.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Town to help inform updates and the development of local plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

The Town did not integrate the 2013 risk information into current planning or regulation documents, but it did give a general awareness of the Town's vulnerabilities to natural hazards and the need for mitigation projects to protect the Town's assets and lessen the impacts of hazard events.

Process Moving Forward

Moving forward, the Town may utilize the hazard information when reviewing a site plan or other type of development applications.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Montezuma will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

G.7.2 Monitoring, Evaluation and Updating the Plan

The Town will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The Town will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The Town Clerk will be responsible for representing the Town in the County HMPC, and for coordination with Town staff and departments during plan updates. The Town realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

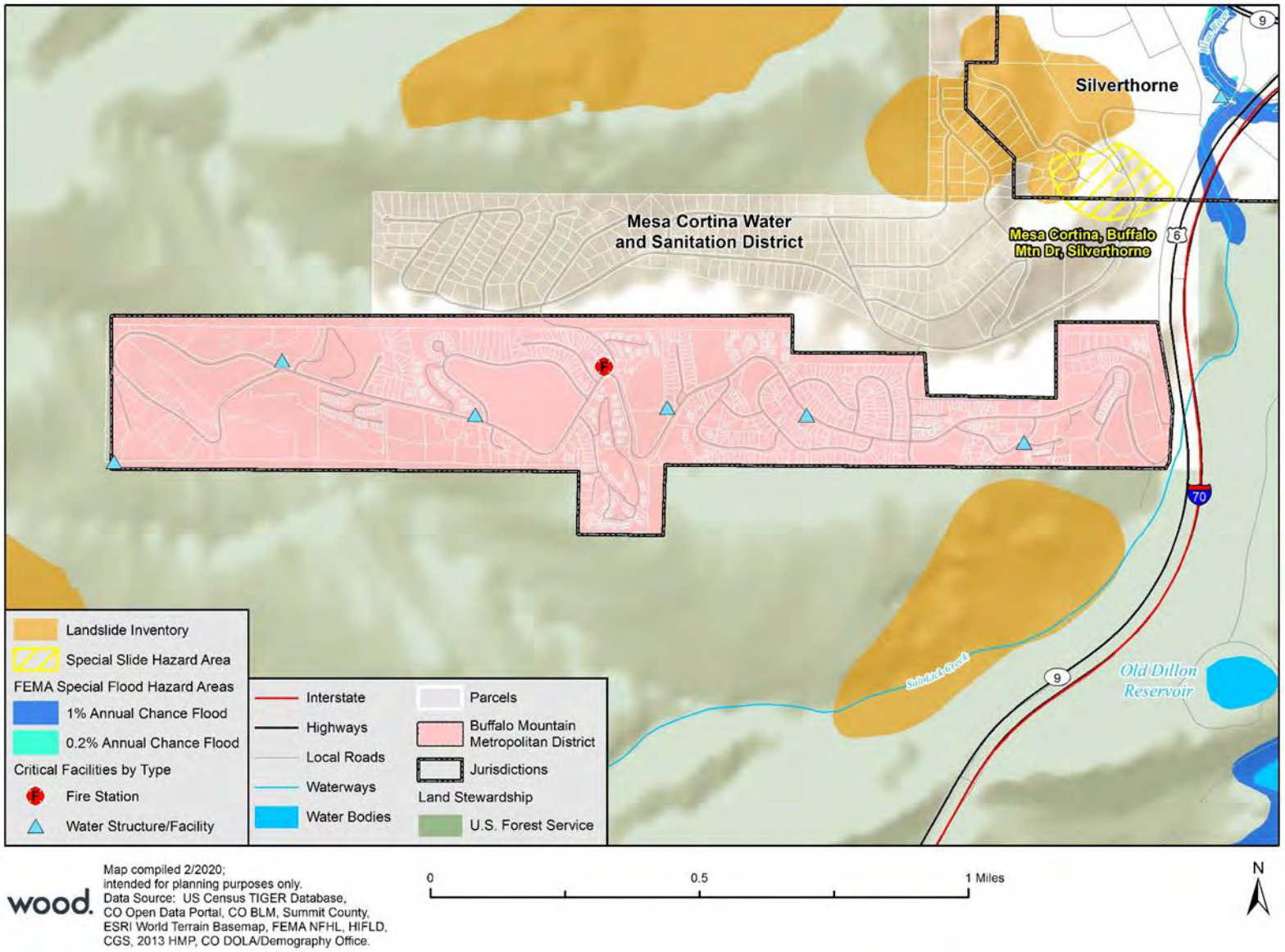
Annex H: Buffalo Mountain Metropolitan District

H.1 Community Profile

Buffalo Mountain Metropolitan District is a special district in Summit County, which provides services for the Wildernest subdivision located on the southwest side of the Town of Silverthorne. The District provides water and sewer, road maintenance, and snow removal services and also functions as a homeowners' association providing architectural review and covenant enforcement. The District also coordinates with the U.S. Forest Service and Summit County, who own and manage most of the surrounding land.

The District operates under the direction of an elected Board of Directors that sets policy decisions. The District serves over 2,400 properties located on 300 acres. Figure H-1 shows the location of the Buffalo Mountain Metropolitan District as well as all available local hazards. Nine critical facilities are located within the district boundaries.

Figure H-1 Buffalo Mountain Metropolitan District and Local Hazards



H.2 Hazard Identification and Profiles

Representatives of the Buffalo Mountain Metropolitan District identified the hazards that affect the District and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and planning significance specific to the District (see Table H-1). In the context of the countywide planning area, there are no hazards that are unique to the Buffalo Mountain Metropolitan District.

Table H-1 Buffalo Mountain Metropolitan District—Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Incidents	Isolated	Unlikely	Limited	Low
Drought	Large	Likely	Limited	Medium
Earthquake	Large	Occasional	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Flood	Isolated	Occasional	Limited	Low
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Limited	Low
Landslide, Mudflow/Debris Flow, Rockfall	Small	Occasional	Limited	Low
Lightning	Large	Likely	Limited	Low
Pest Infestation (Forest and Aquatic)	Large	Highly Likely	Limited	Low
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Highly Likely	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

H.3 Vulnerability Assessment

The intent of this section is to assess Buffalo Mountain Metropolitan District's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan.

H.3.1 District Asset Inventory

Table H-2 shows the total number of improved parcels, properties, and their improvement and content values for the District. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a

percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, 100% for Commercial structures, and 0% for Exempt parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category. The districts' property and critical facility exposures are also included in the county-wide exposures. These counts are also included here for additional clarity of property and critical facilities within the districts.

Table H-2 Buffalo Mountain Metropolitan District—Property Exposure

Parcel Type	Total Properties	Improved Value	Content Value	Total Value
Commercial	7	$1,279,652	$1,279,652	$2,559,304
Exempt	82	$0	--	$0
Residential	2,352	$862,389,213	$431,194,607	$1,293,583,820
TOTAL	**2,441**	**$863,668,865**	**$432,474,259**	**$1,296,143,124**

Source: Summit County Assessor Data, DOLA, November 2019

Table H-3 lists critical facilities in the District that are important to protect in the event of a disaster. Note that there is one critical facility the HMPC indicated should not be disclosed in terms of location or name, so while it was considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, it will not be described in detail nor will it be shown in any maps. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the main plan HIRA document.

Table H-3 Buffalo Mountain Metropolitan District Critical Facilities

FEMA Lifeline	Critical Facility Type	Total
Communications	Public Safety Transmitters*	1
Safety and Security	Fire Station	1
Water Intake Facility	Water Plant For Community	1
Water Tank 2	Water Storage & Pump Station	1
Water Tank 2B	Water Storage & Pump Station	1
Water Tank 3	Water Storage & Pump Station	1
Water Tank 4	Water Storage & Pump Station	1
Water Tank 5	Water Storage & Pump Station	1
Water Tank 6A & 6B	Water Storage	1
TOTAL		**9**

* This facility's location will not be disclosed, and no additional details will be provided.
Source: Summit County, DOLA, HIFLD.

H.3.2 Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk to hazards deemed significant for the District. Vulnerability details for all hazards other than Wildfire are often difficult to compile or estimate for specific communities and are already sufficiently described in Section 3.3.3 of the Base Plan. All hazards available for mapping are represented in Figure H-1. Note that the Buffalo Mountain Waste Water

Treatment Plant is located within the Town of Silverthorne's boundaries, and as such is exposed to potential inundation from the Dillon Dam. However, the dam incident hazard is not profiled or discussed further due to lack of relevance to the rest of the Buffalo Mountain Metropolitan District.

Wildfire

General Property

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which breaks up areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in the Buffalo Mountain Metropolitan District. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. Property improvements and estimated content values were then totaled to arrive at the Total Value column, which is also the estimated potential loss as wildfires typically result in complete loss to structure and contents.

The District was found to intersect with wildfire areas rated as Medium and High, and results are summarized by property type in Table H-4. There are 780 properties falling in the Medium threat category with over $453 million at potential risk, most being Residential in nature. A total of 88 properties are located in High threat categories, with over $54 million in total values at risk, with most also being Residential properties.

Table H-4 Buffalo Mountain Metropolitan District—Property Values in Wildfire Zones

Wildfire Threat	Parcel Type	Total Properties	Improved Value	Content Value	Total Value and Loss Estimate	Population
High	Exempt	2	$0	--	$0	--
	Residential	86	$36,082,388	$18,041,194	$54,123,582	267
	TOTAL	**88**	**$36,082,388**	**$18,041,194**	**$54,123,582**	**267**
Medium	Commercial	3	$687,642	$687,642	$1,375,284	--
	Exempt	33	$0	--	$0	--
	Residential	744	$301,144,430	$150,572,215	$451,716,645	2,306
	TOTAL	**780**	**$301,832,072**	**$151,259,857**	**$453,091,929**	**2,306**
GRAND TOTAL		**868**	**$337,914,460**	**$169,301,051**	**$507,215,511**	**2,573**

Source: Summit County GIS/Assessor Office, DOLA, CO-WRAP, U.S. Census, Wood analysis

Many residents in the Wildernest subdivision in Buffalo Mountain Metropolitan District do not have access to private transportation in the event of an emergency, so evacuation is a concern for wildfire and other emergency events.

People

The last column of Table H-4 above summarizes the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted, Buffalo Mountain Metropolitan District has an estimated 2,573 people at risk of Medium and High rated wildfire zones. These totals were estimated by multiplying

the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire threat zone/s.

Critical Facilities and Infrastructure

All of the critical facilities managed by the District are found in wildfire assessment areas, but only 6 of them are located in wildfire assessment areas rated as Medium in severity. These are as listed below.

- Public Safety Transmitter (Communications Lifeline)
- Fire Station 14 in Wildernest (Safety and Security Lifeline)
- Water Storage Facility (Food/Water/Shelter Lifeline)
- Water Storage & Pump Station structures (Food/Water/Shelter Lifeline)

Economy

Tourism, the accommodation and food services industry (e.g. hotels and restaurants), and retail are major components of Summit County's economy, and the district's as well. Wildland fires can, for example, lead to significant tourism reductions due to health and safety concerns, causing lost revenues from lack of visitation, stays in hotels, spending on restaurants and other commerce sources, and more.

Historical, Cultural, and Natural Resources

Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the climate change trend which is leading to hotter, more widespread, and destructive fires can make it more difficult for the environment to recover, and lead to increased flood runoff or other secondary/cascading hazards. This can severely impact water quality and watershed health for years after the fire.

With regards to historic or cultural structures and resources, wildfires would affect those in similar ways as general property and critical facilities/infrastructure, having the potential for burn downs and hence possible complete loss of important natural resources in the District and nearby areas.

Future Development

The Wildernest subdivision has reached 95 percent buildout, so future development will be limited and subject to wildfire mitigation policies of Summit County. There has been no pressure to develop hazardous areas, including wildfire zones.

H.3.3 Growth and Development Trends

As previously stated, the Wildernest subdivision is a high-density residential neighborhood that has reached 95 percent buildout, so future development will be limited and subject to codes and ordinances of Summit County, as well as the subdivision covenant. Only a 1% development increase has occurred since 2008. There has been no pressure to develop hazardous areas.

H.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into four sections:

regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

H.4.1 Regulatory Mitigation Capabilities

Regulatory mitigation capabilities include the planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities. The District is governed under the policies and programs of Summit County, including its building codes and land use planning. There are architectural guidelines that are part of the site plan review requirements in the Wildernest subdivision. The District also has a service plan, which includes information on the services the District has the authority to provide, and a long range financial plan. The table below lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

Table H-5 Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	District Services Plan(s)
Zoning Ordinance	N/A	
Subdivision Ordinance	Yes	Declaration of Protective Covenants
Growth Management Ordinance	No	
Floodplain Ordinance	N/A	
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	N/A	
Building Code	Yes	2006 International Building Code
Fire Department ISO Rating	Yes	2
Erosion or Sediment Control Program	Yes	Summit County Building Code
Stormwater Management Program	Yes	Article VII of District Rules & Regulations
Site Plan Review Requirements	Yes	District Architectural Review Documents
Capital Improvements Plan	Yes	2015 Infrastructure Improvements Plan
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Summit County Emergency and Disaster Preparedness
Other Special Plans	No	
Flood Insurance Study or Other Engineering Study For Streams	No	
Elevation Certificates	N/A	

H.4.2 Administrative/Technical Mitigation Capabilities

The District works with Summit County departments of engineering, emergency management, and GIS on activities related to hazard mitigation and loss prevention within the District. Summit Fire & EMS Authority provides wildfire protection within the Buffalo Mountain Metropolitan Service District. The District has one full-time employee, the district manager, and one part-time Administrator. Other services are contracted through a separate business.

The table below identifies the personnel responsible for activities related to mitigation and loss prevention in the District.

Table H-6 Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/Engineer with Knowledge of Land Development/Land Management Practices	No		
Engineer/Professional Trained in Construction Practices Related to Buildings and/or Infrastructure	Yes	Sub-Contractor Engineering Firm Works For the District	
Planner/Engineer/Scientist with an Understanding of Natural Hazards	No		
Personnel Skilled in GIS	Yes	Manager & Water/Sewer Department	
Full Time Building Official	No		
Floodplain Manager	No		
Emergency Manager	Yes	Manager	
Grant Writer	Yes	Manager	
Other Personnel	Yes	Water/Sewer/Road Operations	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	ARC GIS On-Line	
Warning Systems/Services (Reverse 9-11, Cable Override, Outdoor Warning Signals)	Yes	Electronic Message Board, Group emails to all property owners	
Other			

H.4.3 Fiscal Mitigation Capabilities

The District receives revenue from rates, fees, property taxes, and interest on investments. Fiscal mitigation capabilities are financial tools or resources that the Buffalo Mountain Metropolitan District could or already does use to help fund mitigation activities. These include the following:

- Capital improvements project funding
- Taxes for specific purposes
- Fees for water, sewer, and other services
- Impact fees for new development
- General obligation bonds

H.4.4 Mitigation Outreach and Partnerships

Other mitigation related activities include the following:

- Since 2004, the District's summer newsletter has included outdoor watering guidelines to promote water conservation.

- Since 2007, quarterly newsletters include fire safety, wildfire mitigation, and emergency preparedness information.
- The District has worked with property owners since 2005 to provide assistance with the removal of beetle-infested and dead trees to improve forest health and reduce wildfire risk. Over 4,000 trees have been removed.
- For the past four years, the District has assisted property owners in removing dead and fallen trees by offering free chipping services. As of 2013, 95% of the dead and fallen trees have been removed within the District boundaries.
- Partnership efforts, including a 900-acre fuel break created by the U.S. Forest Service around a subdivision near the Buffalo Mountain Metropolitan District, have resulted in demonstrated mitigation success within the County. The project was tested in June 2018 and helped to reduce damages from the Buffalo Mountain Fire.

H.4.5 Past Mitigation Efforts

- During the Buffalo Mountain Fire in 2018 which threatened the Wildernest neighborhood, the District lost power leading to the inability to pump water to serve customers. As a result of this incident the District has purchased a generator to be able to pump water if power is lost again. At the time of this plan update, the generator has been put in place but has not been tested yet. Refer to mitigation action Buffalo Mountain Metropolitan District – 3 Backup Power for Critical Facilities.
- As of 2020 BMMD is in the process of constructing a new 250,000-gallon underground water tank and pump station that will enhance water storage and supplies during times of drought.
- The District has installed one of four underground PRV vaults to upgrade the water distribution system to allow for automatic fire flow rather than rely on manual operation.

H.4.6 Opportunities for Enhancement

Based on the capability assessment, the District has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the District will lead to more informed staff members who can better communicate this information to the public.

H.5 Mitigation Goals and Objectives

The Buffalo Mountain Metropolitan District adopts the hazard mitigation goals and objectives developed by the Hazard Mitigation Planning Committee and described in Chapter 4 Mitigation Strategy.

H.6 Mitigation Actions

The Buffalo Mountain Metropolitan District identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: Buffalo Mountain Metropolitan District—1 Defensible Space

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Reduce the risk of wildfire in the Wildernest subdivision by assisting property owners with the creation of defensible spaces around residential buildings.
Hazard(s) Mitigated:	Wildfire
Priority:	High
Issue/Background:	Wildernest is a high-density residential subdivision of 2,970 living units on approximately 300 acres. It is heavily forested and surrounded by Summit County open space and national forest, both of which are also heavily forested. The District has identified approximately 2,500 trees within 10 feet of residential structures, putting these structures at high risk in the event of a forest fire.
Ideas for Implementation:	For the past three years, the District has provided assistance to property owners by chipping logs and branches removed from private property in addition to removing trees from rights-of-way within the subdivision. The District could provide greater assistance in creating defensible spaces if additional funding were available.
Responsible Agency:	Buffalo Mountain Metropolitan District
Partners:	Summit County
Potential Funding:	District revenue from rates, fees, property taxes, and interest on investments Summit County Wildfire Mitigation Grant Program FEMA Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program
Cost Estimate:	$250,000 to remove the estimated 2,500 trees from within 10 feet of residential structures.
Benefits: (Losses Avoided)	• Reduced risk of property damage and loss from wildfire. (Estimated replacement cost of all residential property in excess of $500 million). • Protection of public health and safety.
Timeline:	Annual Implementation
Status:	This action has been and continues to be implemented. BMMD continues to enforce Protective Covenant rules to mandate property owners remove dead and diseased flammable vegetation. Further, BMMD was awarded a $25,000 wildfire defensible space

grant from Summit County this year as a pass along grant to community property owners to encourage removal of flammable vegetation within 30' of the home.

Mitigation Action: Buffalo Mountain Metropolitan District—2 Digital Data and Maps

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Enhance the ability to ensure continuity of water and sewer service during emergencies by converting paper as-built infrastructure drawings to digital format.
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Medium
Issue/Background:	As-built drawings for the approximately 14 miles of water and sewer mains in Wildernest exist only on 30-year old paper sheets. They are difficult to update, subject to loss or deterioration, and may not provide an appropriate level of detail during an emergency.
Ideas for Implementation:	Participate with other Summit County entities to obtain up-to-date aerial imagery, convert paper as-built drawings to digital format, field verify locations of water and sewer infrastructure components, and annotate digital drawings with critical infrastructure data.
Responsible Agency:	Buffalo Mountain Metropolitan District
Partners:	Other Summit County jurisdictions
Potential Funding:	District revenue from rates, fees, property taxes, and interest on investments,
Cost Estimate:	$25,000 ($2,000 for aerial imagery, $16,000 for data conversion and field verification, $7,000 for computer hardware and software).
Benefits: (Losses Avoided)	• Improve access to critical infrastructure data at all times, but especially during emergencies. • Protect public health and safety.
Timeline:	Annual Implementation
Status:	This action has been and continues to be implemented. In 2017, BMMD purchased a GPS to accurately locate water, sewer, road, and critical facilities throughout the community. The data was uploaded to the existing BMMD GIS map. On-going maintenance and repairs are also recorded in the GIS system. BMMD has also shared critical infrastructure information with the WildFire Decision Support System (WFDSS). The WFDSS system provides a web-based decision support tool created to help agency administrators and wildland fire managers make informed decisions by easily identifying critical facilities during fires.

Mitigation Action: Buffalo Mountain Metropolitan District—3 Backup Power for Critical Facilities

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Obtain backup power for water pumping stations
Hazard(s) Mitigated:	Multi-Hazard
Priority:	High
Issue/Background:	The District provides water drawn from the Blue River alluvial to the Wildernest subdivision by pumping to a series of underground storage tanks, the uppermost of which is approximately 1,200 feet higher in elevation than the treatment plant. There are five pumping stations, none of which have backup power. Providing backup power would improve continuity of services during emergencies requiring large volumes of water, such as forest fires, which may disrupt normal power supplies.
Ideas for Implementation:	Develop specification, identify suppliers, and purchase backup generators as funding allows.
Responsible Agency:	Buffalo Mountain Metropolitan District
Partners:	
Potential Funding:	District revenue from rates, fees, property taxes, and interest on investments. FEMA Hazard Mitigation Grant Program
Cost Estimate:	$250,000 (five pumping stations at $50,000 each)
Benefits: (Losses Avoided)	• Improve continuity of services during emergencies • Reduce wildfire risk • Protect public health and safety
Timeline:	Completed in 2019
Status:	**Completed.** BMMD recently purchased a portable generator in 2019 to power the water intake facility and all water pump stations throughout the District during power outages.

Mitigation Action: Buffalo Mountain Metropolitan District—4 Drainage Improvement

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Develop drainage improvement strategy to reduce erosion and flooding to avert severe winter weather hazard
Hazard(s) Mitigated:	Multi-Hazard: Flood, Erosion/Deposition, Severe Winter Weather
Priority:	Medium
Issue/Background:	The District topographical location includes steep grades, rising slopes, and varied terrain. During the spring snow melt and/or during summer thunderstorms, high volume water run-off occurs causing erosion to drainage ditches, undermining roadways, and flooding District properties.
Ideas for Implementation:	Engineer and build underground drainage culverts. Expand and/or build larger water quality ponds. Build concrete swell curb and gutter systems.
Responsible Agency:	Buffalo Mountain Metropolitan District – District Manager
Partners:	Summit County
Potential Funding:	FEMA Hazard Mitigation Grant Program, District revenue from rates, fees, and property taxes.
Cost Estimate:	$5 million
Benefits: (Losses Avoided)	Provide flood protection. Protect District infrastructure. Maintain roads to allow citizens safe passage.
Timeline:	Annual Implementation.
Status:	Action added in 2013. This action has been and continues to be implemented. In 2015, BMMD constructed two separate underground storm sewer projects including curb/gutter improvements to manage erosion and flooding during high volume water run-off in spring and summer. BMMD is currently planning a similar storm sewer project to begin construction in 2020. This includes a drainage improvement project at the top of Ryan Gulch Road loop to address spring run-off issues and address spring water that runs year-round on the edge of the road.

Mitigation Action: Buffalo Mountain Metropolitan District—5 Wildfire Defensible Space Public Education

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Continue to educate District constituents about wildfire defensible space actions by removal of beetle-infested trees.
Hazard(s) Mitigated:	Wildfire, Pest Infestation (forest)
Priority:	Low
Issue/Background:	The District is a high-density residential subdivision of 2,970 living units on approximately 300 acres. It is heavily forested and surrounded by Summit County open space and national forest, both of which are also heavily forested.
Ideas for Implementation:	Continue to identify dead and fallen trees within the District boundaries and promote defensible space. Mandate property owner removal, pursuant to the District Rules and Regulations.
Responsible Agency:	Buffalo Mountain Metropolitan District – District Manager
Partners:	Other Summit County jurisdictions
Potential Funding:	FEMA Hazard Mitigation Grant Program, District revenue from rates, fees, and property taxes.
Cost Estimate:	$20,000 annually
Benefits: (Losses Avoided)	Reduced risk of property damage and District facilities from wildfire and windstorm. Protection of public health and safety.
Timeline:	Annual Implementation
Status:	Action added in 2013. This action has been and continues to be implemented. As previously stated in Action #1, BMMD was awarded a $25,000 wildfire defensible space grant from Summit County to pass along to community property owners to encourage removal of flammable vegetation within 30' of the home. In August 2019, BMMD mailed out to all community property owners a flyer with information about the importance of defensible space with tips on what to remove to improve a home's chance of surviving a wildfire. To date, 35 properties have applied for grant assistance. BMMD also disseminates information on the District website about the annual Summit County free wood chipping program and encourages property owner participation.

Mitigation Action: Buffalo Mountain Metropolitan District—6 Source Water Protection Plan

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Develop Source Water Protection Plan
Hazard(s) Mitigated:	Wildfire, Drought, HazMat
Priority:	High
Issue/Background:	The program would encourage community-based protection and non-regulatory preventive management strategies to ensure that all District drinking water resources are kept safe from future contamination.
Ideas for Implementation:	Delineate the source water protection area, inventory potential sources of contamination, develop best management practices and implement protection measures.
Responsible Agency:	Buffalo Mountain Metropolitan District – District Manager
Partners:	Other Summit County jurisdictions
Potential Funding:	CO Department of Public Health and Environment's SWAP Development and Implementation Grant.
Cost Estimate:	$50,000
Benefits: (Losses Avoided)	Provide protection of natural resources from hazard impacts.
Timeline:	March 16. 2017
Status:	**Completed.** Action added in 2013. In March 2017, BMMD completed a State approved Source Water Protection Plan. The planning effort consisted of public planning meetings and individual meetings with water operators, government, local community members, and agency representatives. The Plan provides an inventory of potential contaminant sources and best management practices to mitigate concerns.

Mitigation Action: Buffalo Mountain Metropolitan District—7 Email Database for Emergency Communication with Public

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Develop email database of District constituents to electronically communicate in cases of emergency.
Hazard(s) Mitigated:	Multi-Hazard
Priority:	High
Issue/Background:	In cases of emergency, or the need for evacuation, the District needs to create another source of direct communication with District property owners by obtaining email addresses.
Ideas for Implementation:	Request email addresses through quarterly billing statements, newsletter communications, or direct phone contact.
Responsible Agency:	Buffalo Mountain Metropolitan District – District Manager
Partners:	Summit County - Possibly link with SCAlert
Potential Funding:	District revenue from rates, fees, and property taxes.
Cost Estimate:	$2,000 annually
Benefits: (Losses Avoided)	Protection of public health and safety.
Timeline:	Annual Implementation
Status:	Action added in 2013. This action has been and continues to be implemented. BMMD has been successful in obtaining about 95% of customer email contact information. As properties change ownership, BMMD continues to update email information accordingly. This has proved to be an important tool to communicate with customers on a timely basis.

Mitigation Action: Buffalo Mountain Metropolitan District—8 Water Storage Capacity

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Increase Water Storage Capacity
Hazard(s) Mitigated:	Drought
Priority:	High
Issue/Background:	Upgrade the existing water storage tank numbers three (3), four (4) and five (5) from 150,000 gallons to 250,000 gallons or more. Limited land exists at the current sites so the tanks would need to increase in height. In case of drought and limited water supply related thereto, increased water storage capacity would allow the District to supply the community demand. Currently storage capacity is limited to 2 days of supply if the District is unable replenish reserves. If the tanks sizes increase, the District will be able to store at least a week of supply allowing time to replenish in times of drought.
Ideas for Implementation:	Request email addresses through quarterly billing statements, newsletter communications, or direct phone contact.
Responsible Agency:	Buffalo Mountain Metropolitan District – District Manager
Partners:	
Potential Funding:	FEMA Hazard Mitigation Grant Program, Colorado Department of Public Health & Environment (CDPHE), Department of Local Affairs (DOLA), Environmental Protection Agency (EPA)
Cost Estimate:	$6 million
Benefits: (Losses Avoided)	Community health and safety issues if water is not supplied as needed. Avoid having to truck in water from another source.
Timeline:	2022-2027
Status:	New in 2020

H.7 Implementation and Maintenance

Moving forward, the District will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

H.7.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the Metropolitan District to help inform updates and the development of District plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

The District did not integrate the 2013 risk information into current planning or regulation documents, but it did give a general awareness of the District's vulnerabilities to natural hazards and the need of mitigation projects to protect the District's critical facilities and lessen the impacts of hazard events.

Process Moving Forward

Moving forward, the District may use the vulnerability information to understand the hazards that pose a risk and the specific vulnerabilities to the jurisdiction in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications within the boundaries of the Buffalo Mountain Metropolitan District area.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from the Buffalo Mountain Metropolitan District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

H.7.2 Monitoring, Evaluation and Updating the Plan

The Buffalo Mountain Metropolitan District will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The District will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The District Manager will be responsible for representing the Metropolitan District in the County HMPC, and for coordination with County staff and departments during plan updates. The Buffalo Mountain Metropolitan District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

Annex I: Fire Protection Districts

I.1 Community Profile

The material presented in this annex applies to the two fire protection districts participating in the Summit County Hazard Mitigation Plan Update 2019-2020, which are described below. Each of the districts participated individually in this planning process.

Figure I-1 and Figure I-2 shows a map of the Summit Fire & EMS Authority and Red, White and Blue Fire Protection District boundaries.

Summit Fire & Emergency Medical Service Authority (SFE)

The Lake Dillon Fire Protection District (LDPD), entered into an Intergovernmental Agreement (IGA) with Copper Mountain Consolidated Metropolitan District to form the, Summit Fire & EMS Authority (SFE) in 2017, which is funded by taxpayers through their property tax as well as from fees from Emergency Medical Transports. It is a career department with 61 commissioned firefighters, 34 civilian staff positions, four 24-hour stations, and two reserve stations covering Frisco, Silverthorne, Dillon, Keystone, Copper Mountain, and Montezuma. SFE is the successful consolidation of five former fire districts. Currently it is operating as part of an Authority model which now includes the all-hazards incidents formerly covered by the Copper Mountain Consolidated Metro District. It has a response area of 419 square miles and protects the majority of the shoreline of Lake Dillon, Loveland Pass, which is a designated hazardous materials corridor by the Colorado Department of Transportation, and approximately 24 miles of the highest stretch of Interstate 70 in the United States. The ski resorts of Arapahoe Basin, Copper Mountain, and Keystone are also included in the protection area. Protected municipalities include Dillon, Frisco, Montezuma, and Silverthorne as well as 13 water entities or districts.

Red, White, and Blue Fire Protection District

The name Red, White, and Blue originates from three different fire companies that were organized in 1882 to protect the mining district of Breckenridge after three large fires almost destroyed the town. In 1947, the fire department changed names to the Breckenridge Volunteer Fire Department. In 1976, a special taxing district was officially formed renaming the department to the Red, White, and Blue Fire Protection District (RWBFPD), as it is called today. The District covers approximately 138 square miles of Summit County, including the towns of Breckenridge and Blue River, the Breckenridge Ski Resort, and unincorporated sections of Summit County. The District boundaries are Hoosier Pass to the south, Frisco town limits to the north, the Continental Divide to the east, and the Ten Mile range to the west. Red, White, and Blue is a career department with approximately 60 paid personnel in 5 divisions: Operations, Administration, Community Risk Management, Emergency Medical Services and Training.

Figure I-1 Summit Fire & EMS Authority

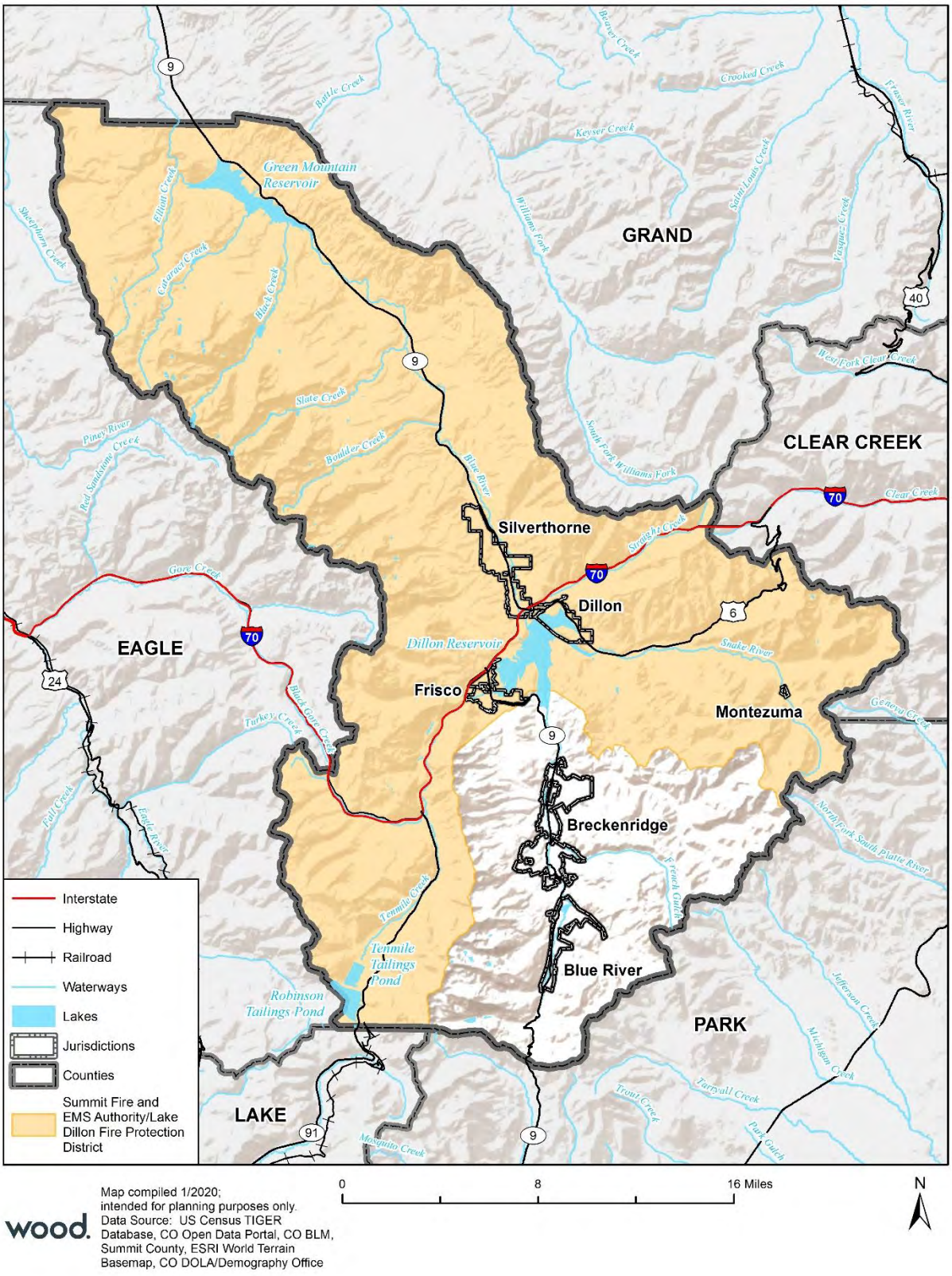
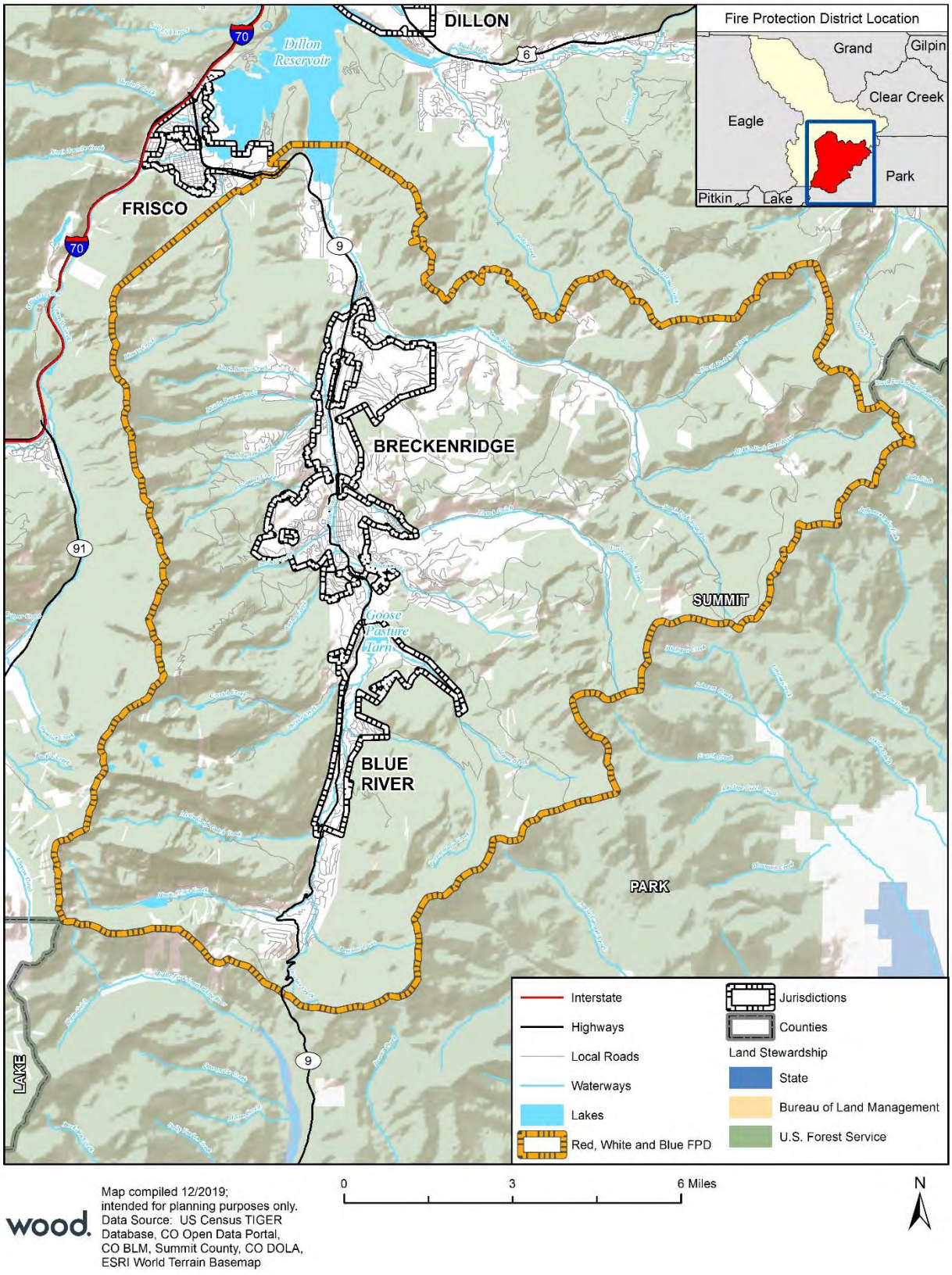


Figure I-2 Red, White and Blue Fire Protection District (FPD)



I.2 Hazard Identification and Profiles

Representatives from each district identified the hazards that affect the districts and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and overall planning significance (see Table I-1). Each of the districts includes similar terrain and hazards; the hazards that impact the districts are summarized below. Magnitude and overall hazard rating are assessed in terms of impacts to the fire protection districts.

Table I-1 Summit County Fire Protection Districts Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Highly Likely	Limited	Moderate
Dam Failure	Small	Unlikely	Critical	Low
Drought	Large	Likely	Critical	Moderate
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Small	Unlikely	Limited	Low
Flood	Small	Likely	Limited	Moderate
Hazardous Materials Release (Transportation)	Isolated	Highly Likely	Critical	Moderate
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Likely	Critical	Moderate
Lightning	Large	Highly Likely	Critical	Moderate
Pest Infestation (Forest and Aquatic)	Large	Likely	Critical	Moderate
Severe Winter Weather	Large	Likely	Limited	Moderate
Wildfire	Large	Highly Likely	Catastrophic	High
Wildlife-Vehicle Collisions	Small	Likely	Limited	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

I.3 Vulnerability Assessment

The intent of this section is to assess the vulnerability of the fire protection districts separate from that of the planning area as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment in the main plan. For the Districts' purposes, wildfire is the main hazard of concern and for which the Districts have responsibilities. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment in the main plan.

District Asset Inventory

Table I-2 shows the total number of improved parcels, properties, and their improvement and content values for the property located within the Fire Protection Districts (FPDs). Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS

format. Contents exposure values were estimated as a percent of the improvement value based on FEMA methods. Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table I-2 Fire Protection Districts Improved Parcel and Property Exposure

Fire Protection District	Parcel Type	Totals Properties*	Improved Value	Content Value	Total Value
Red, White and Blue FPD	Agricultural	14	$13,047,967	$13,047,967	$26,095,934
	Commercial	601	$261,273,441	$261,273,441	$522,546,882
	Exempt	1,171	$0	--	$0
	Residential	12,079	$8,514,100,330	$4,257,050,165	$12,771,150,495
	Vacant	39	$198,203,216	--	$198,203,216
TOTAL		**13,904**	**$8,986,624,954**	**$4,531,371,573**	**$13,517,996,527**
Summit Fire & EMS	Agricultural	129	$115,365,898	$115,365,898	$230,731,796
	Commercial	927	$506,316,200	$506,316,200	$1,012,632,400
	Exempt	1,429	$0	--	$0
	Industrial	13	$797,324,710	$1,195,987,065	$1,993,311,775
	Natural Resources	1	$1,827	$1,827	$3,654
	Residential	18,544	$9,882,530,073	$4,941,265,037	$14,823,795,110
	Utilities	2	$1,313,104	$1,969,656	$3,282,760
	Vacant	76	$222,103,986	--	$222,103,986
TOTAL		**21,121**	**$11,524,955,798**	**$6,760,905,683**	**$18,285,861,481**
GRAND TOTAL		**35,025**	**$20,511,580,752**	**$11,292,277,256**	**$31,803,858,008**

Source: Summit County Assessors Data, November 2019.

*Property totals were obtained by counting the number of separate property records that were part of the same parcels. As such, the improved values and subsequent totals stem from the total individual property records, not stand-alone parcel totals.

Table I-3 lists summary information about all the critical facilities and other community assets identified by the HMPC as important to protect or provide critical services in the event of a disaster. These are categorized by FEMA Lifeline. Note that there were several critical facilities the HMPC indicated should not be disclosed in terms of location or name, while they were considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, they will not be described in detail nor will they be shown in any maps. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the Base Plan.

Table I-3 Critical Facilities and Infrastructure within Fire Protection District Boundaries – Summary

Fire District	FEMA Lifeline	Critical Facility Type*	Total
Red, White and Blue FPD	Communications	Communications/Cell Towers	2
		Public Safety Transmitters	1
	Energy	Energy Substations	1
	Food/Water/Shelter	Static Water Structures	11
		Wastewater Facilities	3
	Hazardous Materials	HazMat Tier II SARA Facilities	4
	Health and Medical	Ambulance Stations	1
		Medical Facilities	1
	Other/Schools	Schools	5
	Safety and Security	Fire Lookout Locations	9
		Fire Station	4
		Government Buildings	12
		Incident Facilities	2
		Police Stations	3
	Transportation	Helipads	2
	TOTAL		**61**
Summit Fire & EMS	Communications	Communications/Cell Towers	6
		Information Centers	4
		Public Safety Transmitters	4
	Energy	Energy Substations	3
	Food/Water/Shelter	Static Water Structures	9
		Wastewater Facilities	15
	Hazardous Materials	HazMat Tier II SARA Facilities	13
	Health and Medical	Medical Facilities	3
	Other/Schools	Schools	7
	Safety and Security	Fire Lookout Locations	19
		Fire Station (including ambulance)	6
		Government Buildings	28
		Incident Facilities	5
		Police Stations	4
	Transportation	Helipads	5
	TOTAL		**131**
GRAND TOTAL			**192**

* Some facilities' locations will not be disclosed, and no additional details will be provided.
Source: Summit County HMPC, Summit Fire & EMS , Red, White and Blue FPD

Members of Summit Fire & EMS HMPC noted, in addition, the following critical facility and other community asset replacement values, which may not be accurate as of 2019 costs but provide a general guideline of possible costs incurred if these facilities were affected by various hazards.

- Lake Dillon Fire Protection District Station 2 – Frisco: $9.5 Million (Occupancy of 20 people)
- Lake Dillon Fire Protection District Station 8 – Dillon: $7.5 Million (Occupancy of 13 people)
- Lake Dillon Fire Protection District Headquarters Building: $5.5 Million (District Administrative and EMS Offices – Occupancy of 30 people)

- Lake Dillon Fire Protection District Station 11 – Keystone: $9.5 Million (Fire Station and Support and Fleet Services – Occupancy of 50 people)
- Lake Dillon Fire Protection District Station 12 – Summit Cove: $3.5 Million (EMS Crew only)
- Lake Dillon Fire Protection District Station 14 – Wildernest: $3 Million (Not staffed)
- Copper Mountain Metropolitan District (SFE) Station 1 – Copper Mountain $9.5 Million (Occupancy of 15)

The Red, White, and Blue Fire Protection District's 2020 Community Risk Assessment: Standards of Cover includes the following critical infrastructure and key resources located in each of the RWBPD response areas.

Table I-4 Red, White, and Blue Fire Protection District's Critical Facilities and Key Resources

Response Area	Critical Facility	Key Resources*
Station 4 Response Area	Red, White, & Blue Fire Station 4	Breckenridge Nordic Center
	Summit High School	Colorado Mountain College
	Town of Breckenridge Water Treatment	
	Four Mile Bridge	
	Town of Breckenridge Roads, Summit County Roads, State of Colorado Roads	
	Town of Breckenridge Water Distribution Resources (Plants, Pipelines, Tanks, Hydrants, Tarn, etc.)	
	FCC Cell Phone/Radio Tower Sites	
	Alpensee Water Distribution Resources (Plants, Pipelines, Tanks, Hydrants, etc.)	
	Swan River Water Distribution Resources (Plants, Pipelines, Tanks, Hydrants, etc.)	
	Cistern Access Points	
	Upper Blue Sanitation Waste Water Distribution Resources (Plants, Pipelines, Tanks, etc.)	
Station 5 Response Area	Breckenridge Ski Resort	Breckenridge Grand Vacations Properties (Grand Timber, Grand Lodge, Grand Colorado, etc.) (Key Resource)
	Town of Breckenridge Water Distribution Resources (Plants, Pipelines, Tanks, Hydrants, Tarn, etc.)	Breckenridge Nordic Center
	Red, White & Blue Fire Station 5	Crystal Peaks Lodge
	Town of Breckenridge Roads, Summit County Roads	One Ski Hill Place
Station 6 Response Area	City Market	Beaver Run Resort
	Breckenridge Arts District/Historical District	Marriott Mountain Valley Lodge
	Breckenridge Ski Resort	Residence Inn by Marriott

Response Area	Critical Facility	Key Resources*
	Breckenridge Elementary	Breckenridge Grand Vacations Properties (Grand Timber, Grand Lodge, Grand Colorado, etc.)
	Upper Blue Elementary	Double Tree by Hilton
	Town of Breckenridge Town Hall	Main Street Station
	Town of Breckenridge Public Works Facilities	Village at Breckenridge
	Red, White & Blue Fire Station 6	Lodge and Spa at Breckenridge
	Town of Breckenridge Police Department	Valdoro Mountain Lodge
	Summit County Justice Center/Jail	Mountain Thunder Lodge
	Old Summit County Courthouse	River Mountain Lodge
	Breckenridge Recreation Center	Blue Sky Resort
	Little Red Schoolhouse	Breckenridge Area Churches
	Carriage House Pre-School	Town of Breckenridge Ice Rink
	Timberline Learning Center	Town of Breckenridge Free Ride Bus Service/Summit Stage Bus System
	Breckenridge Montessori School	Breck Grand Vacations Community Center
	Breckenridge Medical Center	
	High Country Health Care	
	Local Gas Stations	
	Century Link Breckenridge	
	Xcel Energy Gas/Electric Buildings/Grid/Substations	
	Colorado Natural Gas Meter Station	
	Summit County District Attorney's Office	
	Breckenridge Post Office	
	FCC Cell Phone/Radio Tower Sites (Town of Breckenridge, Cell Phone Companies, Local Television, etc.)	
	Town of Breckenridge Water Distribution Resources (Plants, Pipelines, Tanks, Hydrants, Tarn, etc.)	
	Town of Breckenridge Roads, Summit County Roads, State of Colorado Roads	
	Summit County Communications Center 911 Radio Sites (Summit High School, Tyrollean Terrace, Fire Station 4, Peak 10)	
	Upper Blue Sanitation Waste Water Distribution Resources (Plants, Pipelines, Tanks, etc.)	
	Qwest Corporation (Distribution Buildings, service lines, etc.)	
	Cistern Access Points	

Response Area	Critical Facility	Key Resources*
Station 7 Response Area	Town of Breckenridge Water Treatment	
	Red, White & Blue Fire Station 7	
	Town of Blue River Town Hall	
	Town of Breckenridge Roads, Summit County Roads, State of Colorado Roads	
	Blue Lakes Dam	
	Tarn Dam	
	Timber Creek Water Distribution Resources (Plants, Pipelines, Tanks, Hydrants, etc.)	
	Cistern Access Points	
	Upper Blue Sanitation Waste Water Distribution Resources (Plants, Pipelines, Tanks, etc.)	

* RWBPD defines a key resource as publicly or privately controlled resources essential to the minimal operations of the economy and government.

Additional community assets noted by the HMPC include the following:

- Dillon Town Hall
- Frisco Town Hall
- Silverthorne Town Hall
- Summit County Commons Building
- Summit Stage Facilities
- Silverthorne-Dillon Joint Sanitation Plant
- Snake River Sanitation Plant
- Frisco Sanitation District Facilities
- Summit County Emergency Operations Center
- Summit County Community Center
- Silverthorne Recreation Center
- U.S. Forest Service Dillon District Ranger Offices
- Keystone Resort Gondolas
- Dillon Dam and Facilities
- Green Mountain Dam and Facilities
- Eisenhower/Johnson I-70 Tunnels
- Summit Medical Center – Frisco
- Summit Middle School – Frisco
- Frisco Elementary School (Shelter Location)
- Dillon Valley Elementary School
- Silverthorne Elementary School
- Summit Cove Elementary School
- Copper Mt. Metro District Offices

Other areas of concern include the protection of critical watershed areas for the Ten Mile, Snake River, and Lower Blue basins as well as almost 21 miles of Dillon Reservoir shoreline. The watersheds principally serve Summit County, Denver Water, and the Colorado Big Thompson Project for Northern Colorado. Over 49 miles of high-power transmission lines lie within the boundaries of Summit Fire & EMS response areas, which supply major portions of the western United States. The District also is challenged geographically with natural and developed features that make response extremely challenging. Among these are the Dillon Dam and Eisenhower Tunnel, both of which have been identified as National Critical Infrastructure. Protection also includes three mountain passes at the Interstate-70 tunnel approaches, Loveland Pass (which is a Colorado Department of Transportation designated Hazardous Materials route), and Ute Pass (which carries a significant amount of hazardous materials from the Henderson Mill).

The RWBFPD noted that the Goose Pasture Tarn Reservoir is a critical water source for fire protection and drinking water supplies for the Town of Breckenridge and surrounding areas. The District is geographically isolated and will also rely on aid from outside the County.

Vulnerability by Hazard

This section analyzes existing and future structures and other assets at risk to hazards of significance to the fire protection districts and estimates potential losses as applicable. For the Districts' purposes, wildfire is the only hazard that will be addressed herein due to jurisdictional power and responsibility by the FPDs over fire-related facility and infrastructure maintenance.

Wildfire

General Property

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which breaks up areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in the fire protection districts. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. Property improvements and estimated content values were then totaled to arrive at the Total Value column, which is also the estimated total potential loss. The breakdown of property values in each District by wildfire threat zone is summarized in Table I-5 below:

Table I-5 Property Values in Wildfire Zones by Parcel Type and Fire Area, FPDs

Wildfire Zone	Fire District	Parcel Type	Total Properties	Improved Value	Content Value	Total Value and Loss Estimate (100% of the Total Value)	Population
Medium	Summit Fire & EMS	Agricultural	36	$26,249,340	$26,249,340	$52,498,680	--
		Commercial	585	$259,844,291	$259,844,291	$519,688,582	--
		Exempt	94	$0	--	$0	--
		Industrial	13	$797,324,710	$1,195,987,065	$1,993,311,775	--
		Residential	9,039	$4,570,998,951	$2,285,499,476	$6,856,498,427	28,021
		Utilities	1	$428,966	$643,449	$1,072,415	--
		Vacant	36	$79,522,750	--	$79,522,750	--
	TOTAL		**9,804**	**$5,734,369,008**	**$3,768,223,621**	**$9,502,592,629**	**28,021**
	Red White Blue FPD	Agricultural	8	$10,858,563	$10,858,563	$21,717,126	--
		Commercial	415	$179,054,280	$179,054,280	$358,108,560	--
		Exempt	47	$0	--	$0	--
		Residential	8,484	$5,665,759,297	$2,832,879,649	$8,498,638,946	26,300
		Vacant	15	$4,029,147	--	$4,029,147	--
	TOTAL		**8,969**	**$5,859,701,287**	**$3,022,792,492**	**$8,882,493,779**	**26,300**
GRAND TOTAL			**18,773**	**$11,594,070,295**	**$6,791,016,112**	**$18,385,086,407**	**54,321**
High		Agricultural	8	$5,200,584	$5,200,584	$10,401,168	--

Wildfire Zone	Fire District	Parcel Type	Total Properties	Improved Value	Content Value	Total Value and Loss Estimate (100% of the Total Value)	Population
	Summit Fire & EMS	Commercial	17	$10,538,365	$10,538,365	$21,076,730	--
		Exempt	7	$0	--	$0	--
		Natural Resources	1	$1,827	$1,827	$3,654	--
		Residential	1,039	$693,877,055	$346,938,528	$1,040,815,583	3,221
	TOTAL		**1,072**	**$709,617,831**	**$362,679,304**	**$1,072,297,135**	**3,221**
	Red White Blue FPD	Commercial	1	$13,278,658	$13,278,658	$26,557,316	--
		Exempt	5	$0	--	$0	--
		Residential	654	$358,568,698	$179,284,349	$537,853,047	2,027
	TOTAL		**660**	**$371,847,356**	**$192,563,007**	**$564,410,363**	**2,027**
GRAND TOTAL			**1,732**	**$1,081,465,187**	**$555,242,311**	**$1,636,707,498**	**5,248**
Extreme	Summit Fire & EMS	Agricultural	5	$31,073	$31,073	$62,146	--
		Residential	45	$21,948,088	$10,974,044	$32,922,132	140
	TOTAL		**50**	**$21,979,161**	**$11,005,117**	**$32,984,278**	**140**
	Red White Blue FPD	Residential	65	$42,863,382	$21,431,691	$64,295,073	202
		Vacant	1	$924,720	--	$924,720	--
	TOTAL		**66**	**$43,788,102**	**$21,431,691**	**$65,219,793**	**202**
GRAND TOTAL			**116**	**$65,767,263**	**$32,436,808**	**$98,204,071**	**341**
ALL GRAND TOTAL			**20,621**	**$12,741,302,745**	**$7,378,695,231**	**$20,119,997,976**	**59,911**

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis

Because of its size, SFE has more total property value in wildfire areas than the Red, White and Blue FPD. A summary of properties and values within each FPD at risk of wildfire based on assessment protection areas is included under Table I-6. Per the previous table, most properties at risk of wildfire in the county are located in Medium threat zones, followed by High threat zones and finally Extreme threat zones.

Table I-6 Property Values in Wildfire Zones by FPD

Fire District	Total Properties	Improved Value	Content Value	Total Value and Loss Estimate (100% of the Total Value)	Estimated Population
Red White Blue FPD	9,695	$6,275,336,745	$3,236,787,190	$9,512,123,935	28,529
Summit Fire & EMS	10,926	$6,465,966,000	$4,141,908,041	$10,607,874,041	31,381
TOTAL	**20,621**	**$12,741,302,745**	**$7,378,695,231**	**$20,119,997,976**	**59,911**

Source: Summit County GIS/Assessor Office, CO-WRAP, U.S. Census, Wood analysis

People

The last columns of Table I-5 and Table I-6 above summarize the number of people at risk to wildfire in the analyzed fire zones. Based on the assessment conducted and again due to size, Summit Fire & EMS contain the most exposed population, with an estimated 31,381 people at risk of the rated wildfire zones. These totals were estimated by multiplying the average persons per household in Summit County, which is 3.1, times the number of residential properties falling within the fire threat zone/s.

However, smoke resulting from fire is an issue to local populations, as noted by the Summit County's HMPC. For example, the County Public Health Department has received calls in the past from tourists

asking if they should cancel travel plans in the county due to smoke and potential health and safety related concerns.

Critical Facilities and Infrastructure

The Red, White and Blue FPD has 45 critical facilities located in the Medium fire zone and 2 critical facilities located in the High wildfire threat zone. The Summit Fire & EMS has 67 critical facilities in the Medium fire zone, 16 in the High zone, and 2 in the Extreme wildfire threat zone, as summarized by facility category, type, fire zone, and FPD in the table below.

Table I-7 Critical Facilities in Wildfire Zones by Zone, FPDs

Wildfire Zone	Fire District	FEMA Lifeline	Critical Facility Type	Total
Medium	Red White Blue FPD	Communications	Public Safety Transmitters	2
		Food/Water/Shelter	Wastewater Facilities	3
			Static Water Structures	9
		Hazardous Materials	HazMat Tier II SARA Facilities	3
		Health and Medical	Medical Facilities	1
		Other/Schools	Schools	7
		Safety and Security	Fire Station	4
			Government Buildings	6
			Fire Lookout Locations	6
			Police Stations	3
		Transportation	Helipads	1
	Summit Fire & EMS	Communications	Public Safety Transmitters	3
			Information Centers	1
			Communications/Cell Towers	1
		Energy	Energy Substations	1
		Food/Water/Shelter	Static Water Structures	3
			Wastewater Facilities	11
		Hazardous Materials	HazMat Tier II SARA Facilities	5
		Health and Medical	Medical Facilities	2
		Other/Schools	Schools	4
		Safety and Security	Fire Lookout Locations	12
			Police Stations	3
			Incident Facilities	2
			Government Buildings	12
			Fire Station	5
		Transportation	Helipads	2
TOTAL				**88**
High	Red White Blue FPD	Communications	Communications/Cell Towers	2
	Summit Fire & EMS	Health and Medical	Medical Facilities	1
		Safety and Security	Fire Station	1
			Government Buildings	9
			Incident Facilities	2

Wildfire Zone	Fire District	FEMA Lifeline	Critical Facility Type	Total
			Fire Lookout Locations	2
		Transportation	Helipads	1
TOTAL				**18**
Extreme	Summit Fire & EMS	Food/Water/Shelter	Static Water Structures	1
		Safety and Security	Fire Lookout Locations	1
TOTAL				**2**
GRAND TOTAL				**119**

Source: Summit County, HIFLD, CO-WRAP, Wood analysis

Future Development

Residential development continues to occur in the wildland-urban interface (WUI) where limited access, lack of a central water supply with fire hydrants, and longer response times elevate the risk associated with a wildfire event. Development in wildland-urban interface areas is regulated through the building code and land use planning policies of the jurisdiction in which the development is located. Summit County and the towns of Blue River, Breckenridge, and Silverthorne have wildfire mitigation policies as a part of their county or municipal code. In the years ahead, the Lower Blue River Valley north of Silverthorne to the Grand County line has the greatest potential to see single family residential growth occur in areas rated as moderate or high for fire danger, thereby increasing the number of homes located in the wildland interface.

Other Hazards: Avalanche, drought, flood, lightning, landslides, pest infestation severe winter weather, hazardous materials release

The Districts are also affected by other hazards that exacerbate wildfire hazard conditions, such as drought, lightning, pest infestation and windstorms and are considered medium significance. In addition, lands damaged by wildfire are subject to increased runoff (floods) and erosion as well as landslides, mudslides/debris flows, and rockfall. The HMPC also noted that avalanche hazards are worth noting, as they can affect the FPD resources and their facilities. Due to its unique location, Summit Fire & EMS, along with other areas of Summit County, are geographically isolated and in the event of natural disasters such as blizzards, wildfires, avalanches, or landsides may become isolated for an extended period of time. The Districts protect a variety of critical infrastructures across the county and its jurisdictions, thus the analysis of specific facilities at risk can be referenced in the base plan hazard identification and risk assessment for hazards such as avalanche, flood, landslides, or applicable jurisdictional annexes.

Human-caused disasters such as hazardous materials, bioterrorism, or explosions will also isolate Summit Fire & EMS and other areas of Summit County. This may serve as an impediment for receiving aid from outside the County for a period of time. According to the Colorado Department of Transportation, traffic on Interstate 70 through Summit Fire & EMS boundaries has increased by a factor of three over the past decade.

Growth and Development Trends

Residential development is likely to continue to occur in the wildland-urban interface in both districts. Increasing population also increases the likelihood of a human-caused fire or natural fire forcing the community to evacuate. The Town of Silverthorne has the greatest potential for commercial growth

followed by Frisco and Dillon. Resort growth and redevelopment is projected to occur in Keystone in the Mountain House base area neighborhood and the base area of Peak 8 in Breckenridge. These areas will likely see several hundred new condominium units constructed with underground parking and well over 50,000 square feet of commercial space within the span of the next 10 years.

In the years ahead, the Lower Blue River Valley north of Silverthorne to the Grand County line has the greatest potential to see single family residential growth occur in areas rated as moderate or high for fire danger, thereby increasing the number of homes located in the wildland interface.

I.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into four sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

Regulatory Mitigation Capabilities

Regulatory mitigation capabilities include the planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities. The fire protection districts are governed under the policies and programs of Summit County, including its building codes and land use planning. The fire districts enforce a mitigation appending of the International Fire Code, as amended. The 2018 International Fire Code is adopted and goes into effect January 1, 2020. The fire districts also support programs such as Firewise and Ready, Set, Go. The RWBFPD and SFE both have capital improvement plans for their facilities and apparatus as part of their Strategic Plans.

The Summit Fire & EMS Service Plan was updated and adopted in 2018. The District performs site plan reviews for local jurisdictions. The District has an Insurance Services Office (ISO) rating of 2 for unincorporated areas of the district, and a 10 in areas farther than 5 miles from a response station.

The Red, White, and Blue Fire Protection District participates in the annual wildfire operating plan. The District enforces the 2018 International Fire Code as amended by Summit County and reviews site plan review for emergency access and water supply requirements. The District has an ISO rating of 2 in hydranted areas of the district and 2x in unhydranted areas of the district. In 2020 the District will be pursuing evaluation to lower the insurance rating in unhydranted areas of the district.

Administrative/Technical Mitigation Capabilities

The Districts work with Summit County departments of engineering, emergency management, and GIS on activities related to hazard mitigation and loss prevention. SFE has two IT support specialists in the Support Services Division skilled in GIS. The Fire Marshall, Deputy Fire Marshall, and two fire inspectors are trained in construction practices related to buildings and infrastructure. The RWBFPD Fire Marshal is also trained in these construction practices and in GIS. The Deputy Fire Marshal and Inspector are trained in construction practices related to buildings and infrastructure. Each district has its own grant writing capabilities, and both are career fire departments.

Fiscal Mitigation Capabilities

The fire protection districts are funded through property taxes. Fiscal mitigation capabilities are financial tools or resources that the fire protection districts could or already do use to help fund mitigation activities. These include the following:

- Capital improvements project funding
- Taxes for specific purposes
- Debt through general obligation bonds
- Grants from state and federal agencies

Mitigation Outreach and Partnerships

Other mitigation related activities for each district include the following:

Summit Fire & EMS

- Coordinates annual fire-safety education programs in the schools and for the general public in October of each year as part of the National Fire Protection Association's (NFPA) National Fire Prevention Week. The Community Services Bureau follows the NFPA "Learn Not to Burn" curriculum and teaches it throughout the year to 4 elementary schools, one middle school, and several pre-schools.
- Provides public education and information to citizen groups and homeowners associations concerning fire hazard mitigation and wildfire preparedness. SFE held over 35 meetings with HOA groups to discuss/educate on wildfire issues.
- Maintains a proactive public information office staffed by a full-time community resource officer to keep educational fire safety information, public awareness of fire district activities, and active participation in community events promoting fire safety.
- Participates in the fire hazard mitigation program for the County and its municipalities that utilize strategies similar to the Firewise Communities program.
- Instrumental in planning and organizing the Summit County Incident Management Team in 1996. Summit Fire & EMS became an accredited agency through the Center for Public Safety Excellence in March 2019.
- Actively participated and contributed to the development of an expanded evacuation plan for all areas of Summit County and a majority of the towns protected by the agency.
- Currently participating in a study to determine the effect and designation of hazardous materials routes over Loveland Pass and/or the Eisenhower/Johnson Tunnels on Interstate 70, which is a designated critical infrastructure facility located in both Clear Creek and Summit counties.
- While Lake Dillon Fire-Rescue and the Lower Blue Fire Protection District share an agreement to provide assistance to each other in the event of larger-scale incidents, as of January 1, 2008, Lake Dillon and Lower Blue are now operating under a new, wider intergovernmental agreement that enhances responses , equipment, and administrative assistance between the two departments. Lake Dillon Fire – Rescue merged with the fire department portion of the Copper Mt. Consolidated Metro District in January 2018 and began doing business as the Summit Fire & EMS. In July 2019 SFE

assumed operational functions of the Summit County Ambulance Service (SCAS). In January 2020 SCAS and SFE will become fully merged under the name Summit Fire & EMS.

Red, White, and Blue Fire Protection District

- Provides public education and information in fire safety, Risk Watch, and all-hazard emergency preparedness.
- RWBFPD currently has 9 recognized Firewise communities, including Christie Height, Highlands Park, Miners View Estates, Park Forest Estates, Shock Hill, Summit Estates, The Highlands, The Pines at Four O'clock Subdivision, and White Wolf.
- RWBFPD participates in the implementation of Community Wildfire Protection Plan (CWPP) projects.

Opportunities for Enhancement

Based on the capability assessment, both FPDs have several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the districts to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Colorado's Department of Homeland Security and Emergency Management (DHSEM). Additional training opportunities will help to inform district staff and board members on how best to integrate hazard information and mitigation projects into the district policies and ongoing duties of the district. Continuing to train district staff on mitigation and the hazards that pose a risk to the districts will lead to more informed staff members who can better communicate this information to the public.

I.5 Mitigation Goals and Objectives

Each of the fire protection districts adopts the hazard mitigation goals and objectives developed by the Hazard Mitigation Planning Committee and described in Chapter 4 Mitigation Strategy.

I.6 Mitigation Actions

Each of the fire protection districts identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: SFE—1 Wildfire Mitigation Program

Jurisdiction:	Summit Fire & EMS (SFE)
Action Title:	Maintain and enhance wildfire mitigation program
Priority:	High
Background/Issue:	Summit County has been identified as having a high risk of a catastrophic wildfire. This affects not only the water quality for most of the Front Range of Colorado but major power line grids for the western United States. In addition, Interstate 70, a major transportation corridor, runs directly through Summit County. This stretch is the highest elevation in the country. Summit County is at the epicenter of a massive beetle kill with a 95 percent mortality rate affecting several million acres of land.
Ideas for Implementation:	Maintain funding for code enforcement and public education for a Community Resource Officer (CRO) to perform both education and as needed, enforcement of wildfire matters.
Responsible Agency:	SFE
Partners:	Red, White, and Blue Fire Protection District and Copper Mountain Consolidated Metropolitan District. All municipalities within Summit County and Summit County government.
Potential Funding:	Summit County Government, State of Colorado Grants
Cost Estimate:	$94,500 annually
Benefits: (Losses Avoided)	Unable to place an exact dollar amount; however, the water supply to over 300,000 people in Denver and loss of power to large portions of the west would be in the hundreds of millions of dollars.
Timeline:	
Status:	**Completed**

Mitigation Action: SFE—2 Emergency Generators

Jurisdiction:	Summit Fire & EMS (SFE)
Action Title:	Install emergency generators in one fire station and the SFE Headquarters
Priority:	Medium
Background/Issue:	Lake Dillon Fire Protection District has been identified as having a high risk of a catastrophic wildfire due to massive beetle infestation. Three of the response stations would be directly affected by a likely power outage in the event of a wildfire. The ability to operate the stations as Incident Command Centers, shelters, as well as for incident response is paramount to critical infrastructure protection.
Ideas for Implementation:	Install two back-up generators for fire station 2 and SFE HQ.
Responsible Agency:	SFE
Partners:	Possible U.S. Forest Service, Colorado State Forest Service, law enforcement organizations; FEMA Hazard Mitigation Grant Program
Potential Funding:	Very little funding available locally
Cost Estimate:	$250,000
Benefits: (Losses Avoided)	The ability to operate out of all primary fire response stations during a wildfire, hazardous material incident, or natural disaster will help protect lives and property and the economic engine (tourism, watershed, energy, transportation) not just of Summit County but for the entire State of Colorado.
Timeline:	Implementation in summer 2021 if funding acquired.
Status:	Completed-Continuing. An external natural gas-fueled generator was installed in 2011 and is operational at Station 11 in Keystone. Station 8 in Dillon had a natural gas-fueled generator installed in 2018. Station 1 has backup generator. Budgeting for generators at Station 2 and the SFE Headquarters are included in the five-year capital plan contingent upon available funding.

Mitigation Action: SFE—3 Rural Addressing

Jurisdiction:	Summit Fire & EMS (SFE)
Action Title:	Rural addressing
Priority:	High
Background/Issue:	Many rural subdivisions and residential properties do not have their addresses visibly displayed where they can be viewed from the road or street by emergency responders whether fire, EMS or law enforcement. A survey earlier this year (2013) of wildfire mitigation focus areas by the Summit Wildfire Council clearly demonstrated the lack of addresses that were visible from the street or were lacking altogether.
Ideas for Implementation:	This project would develop a public campaign to get a minimum size of 5 inch numerals that are reflective and placed on a contrasting background to be located within 25 feet of the road right-of-way on an elevated post or fence (minimum of 5 ft. above grade) where the driveway for a property first intersects with the road.
Responsible Agency:	SFE Fire Prevention Division
Partners:	Red, White & Blue Fire Protection District, Summit County Building Department
Potential Funding:	Develop fund-raising campaign to match any federal or state funding that would be available.
Cost Estimate:	$10,000
Benefits: (Losses Avoided)	Further advances public education and awareness of the risks related to delaying a response when an emergency occurs, especially during a wildfire when evacuation accountability is critical.
Timeline:	2020-2025
Status:	Continue – Not completed. Action added in 2013.

Mitigation Action: SFE—4 Additional Response Station in Silverthorne

Jurisdiction:	Summit Fire & EMS (SFE)
Action Title:	Additional Response Station in Silverthorne
Priority:	High
Background/Issue:	The former Station 10 in Silverthorne was used for administrative purposes from ~2002 until the facility was sold to the Town of Silverthorne in 2019. Analysis of population growth and incident statistics have determined that a response station in the Silverthorne area will benefit both the municipality and the growth occurring north of the municipality. There are times when I-70 is closed due to poor weather and the current response time from Station 8 in Dillon is compromised.
Ideas for Implementation:	SFE owns ~1.8 acres of property in the north end of Silverthorne which is ideally suited for a response station. The response station would include an engine, a WUI engine and a medic unit.
Responsible Agency:	SFE
Partners:	Town of Silverthorne
Potential Funding:	A combination of either a Bond or a Mill levy will be needed for construction, equipping and staffing the facility. Relief from a Tax Incremental Funding (TIF) in Silverthorne and Dillon would also assist.
Cost Estimate:	$9 million for construction, $1 million for equipment, and ~$1 million annually for staff.
Benefits: (Losses Avoided)	An additional response station in Silverthorne will assist in maintaining a favorable ISO rating for the area, provide more depth on responses and decrease response time to the municipality.
Timeline:	2022-2023
Status:	New in 2020. This has been added to Strategic Plan in 2019. Funding for this projected is projected to be available by 2022.

Mitigation Action: SFE—5 Backup power to Frisco fire station

Jurisdiction:	Summit Fire & EMS (SFE)
Action Title:	Provide backup power to Frisco fire station to protect continuity of services
Priority:	Medium
Background/Issue:	Backup power is needed for critical facilities in the event that power is disrupted from avalanche, flood, lightning, landslides, severe winter weather, or wildfires. Three of the four current SFE stations have back up power.
Ideas for Implementation:	It is necessary to provide backup power at all fire stations to allow for the continuity of critical services and functions from strategically located facilities.
Responsible Agency:	SFE
Partners:	Town of Frisco, Summit County
Potential Funding:	Budgeted and grant funded; FEMA Hazard Mitigation Grant Program
Cost Estimate:	$85,000
Benefits: (Losses Avoided)	Maintain critical services and capabilities from strategically located fire stations in the event of power loss due to a hazard event Protect public health and safety
Timeline:	2020-2021
Status:	New in 2020.

Mitigation Action: Red, White, and Blue Fire Protection District—1 Defensible Space

Jurisdiction:	Red, White and Blue Fire Protection District
Action Title:	Create public education program encouraging wildfire defensible space
Hazard(s) Mitigated	Wildfire
Priority:	High
Background/Issue:	Create public education initiatives encouraging defensible space around homes in accordance with nationally recognized standards. This would include the removal of pine beetle infested trees.
Ideas for Implementation:	Public education would be accomplished by hiring a production company to produce public service announcements for local television stations, radio stations, newsprint, and other local media sources.
Responsible Agency:	Red, White, and Blue Fire Protection District
Partners:	Town of Breckenridge, Town of Blue River, Summit County, and Summit Fire & EMS
Potential Funding:	Budgeted and grant funding
Cost Estimate:	$40,000
Benefits: (Losses Avoided)	Reduces property loss during wildfire events
Timeline:	Annual Implementation
Status:	Continuing – Annual implementation. Each shift has dedicated defensible space staff that handles the public education and voluntary inspection program. We are working on national certification through NFPA for our staff.

Mitigation Action: Red, White, and Blue Fire District—2 Winter Preparedness Kits

Jurisdiction:	Red, White, and Blue Fire Protection District
Action Title:	Promote household winter preparedness kits
Hazard(s) Mitigated	Severe Winter Weather
Priority:	High
Background/Issue:	The Red, White, and Blue Fire District would coordinate the hiring a production company to educate the public on preparing household winter preparedness or survival kits to have readily available during times of inclement/hazardous winter weather. These public service announcements would be run on local television, radio stations, newsprint, and other sources.
Ideas for Implementation:	Jurisdictions could partner with local merchants/grocers educating public as to what types of supplies would be necessary to include in the kits. Fire protection districts could host preparedness kit sessions at local grocery stores, demonstrating a prepared kit, in addition to distributing a "shopping list" of items they can purchase while at that location.
Responsible Agency:	Red, White, and Blue Fire District
Partners:	Local merchants, Summit County, Towns of Blue River, Breckenridge, Dillon, Frisco, and Silverthorne
Potential Funding:	Budgeted and grant funded
Cost Estimate:	$20,000
Benefits: (Losses Avoided)	• Reduce the number of cars and citizens on roadways during times of inclement/hazardous weather, as supplies would be kept in homes • Improve sustainability of food resources in local markets in the event deliveries to the area become impaired by road and weather conditions
Timeline:	
Status:	**Completed**

Mitigation Action: Red, White, and Blue Fire Protection District—3 Power Backup Generators

Jurisdiction:	Red, White, and Blue Fire Protection District
Action Title:	Provide backup power to fire stations to protect continuity of services
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Medium
Background/Issue: **Ideas for Implementation:**	Backup power is needed for critical facilities. The Red, White, and Blue Fire District would contract for the installation of emergency backup power generators at fire stations to allow for the continuity of emergency response services from strategically located facilities.
Responsible Agency:	Summit County, towns of Breckenridge and Blue River, private sector
Partners:	Public and private sector
Potential Funding:	Budgeted and grant funded; FEMA Hazard Mitigation Grant Program
Cost Estimate:	$250,000
Benefits: **(Losses Avoided)**	Maintain emergency response capabilities from strategically located fire stations in the event of power loss due to a disaster event Protect public health and safety
Timeline:	
Status:	**Completed**

Mitigation Action: Red, White, and Blue Fire Protection District—4 Evacuation Drills

Jurisdiction:	Red, White and Blue Fire District
Action Title:	Conduct periodic community evacuation drills
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Medium
Background/Issue: **Ideas for Implementation:**	Evacuation drills are needed to practice and refine procedures. Conduct periodic community evacuation drills, which include public information and education and appropriate road signage.
Responsible Agency:	Town of Breckenridge, Town of Blue River, Summit County, and Red, White, and Blue Fire District
Partners:	See above, plus various lodging companies/businesses.
Potential Funding:	Budgeted and grant funding
Cost Estimate:	Approximately $10,000 per exercise
Benefits: **(Losses Avoided)**	• Safe and efficient evacuation of citizens and guests in the event of an emergency or disaster. • Minimize loss of life.
Timeline:	Annual Implementation
Status:	Continuing-Annual implementation. This is part of RWB FPD 1 and our defensible space and public education programs.

Mitigation Action: Red, White, and Blue Fire District—5 Hazardous Materials Mapping

Jurisdiction:	Red, White, and Blue Fire District
Action Title:	Inventory and map locations of hazardous materials
Hazard(s) Mitigated:	Hazardous Materials
Priority:	Medium
Background/Issue:	The Red, White, and Blue Fire District would hire a consultant to compile an inventory of hazardous materials processes and their storage (i.e., body shops, woodworking businesses, plastics fabrication, pool and spa water treatments, etc.)
Ideas for Implementation:	This information would be mapped using GIS and analyzed with maps of hazard prone areas, such as the floodplain, and provided to first responders and other emergency planning organizations
Responsible Agency:	Red, White, and Blue Fire Protection District
Partners:	Town of Breckenridge, Town of Blue River, Summit County, Lake Dillon Fire Rescue, Summit County Local Emergency Planning Committee (LEPC)
Potential Funding:	Budgeted and grant funding
Cost Estimate:	$20,000
Benefits: (Losses Avoided)	• Improve responder knowledge of potential hazardous material release • Identify populations at risk • Protect public health and safety
Timeline:	2009–2013
Status:	Continuing - In progress. This project is currently in progress and is now part of a larger project to identify Critical Infrastructure and Key Resources.

Mitigation Action: Red, White, and Blue Fire District—6 Rural Addressing

Jurisdiction:	Red, White, and Blue Fire District
Action Title:	Rural addressing
Hazard(s) Mitigated:	Wildfire
Priority:	Low
Background/Issue:	This project would encompass firefighters hanging reflective address signs in rural areas of the District. This project would first be completed in Blue River, where addresses are hard for firefighters to see because of the nature of the road system. The second part of this program would be to install these signs in our rural areas as part of our mitigation inspections that are required as part of the building process. This program would help with evacuation and response to our rural areas by making the addresses easy for all responders to find.
Ideas for Implementation:	Booth at Town of Blue River cleanup day. Tie in as part of the permit cost for County required mitigation inspections.
Responsible Agency:	Red, White and Blue Fire Protection District
Partners:	Town of Blue River and Summit County
Potential Funding:	Rural Wildfire Funds
Cost Estimate:	$4,000
Benefits: (Losses Avoided)	Easier identification of addresses both during the day and at night.
Timeline:	3 years
Status:	Continuing - In progress. Action added in 2013. This is an ongoing project that is tied to our mitigation program. To date just over 150 reflective address signs have been installed in Blue River.

Mitigation Action: Red, White, and Blue Fire District—7 Firewise Communities Program

Jurisdiction:	Red, White, and Blue Fire District
Action Title:	Firewise communities program
Hazard(s) Mitigated:	Wildfire
Priority:	Low
Background/Issue:	This program would increase the awareness of mitigation throughout our community. It would enhance what has been done through requirements of Summit County to ensure that any mitigation work that is complete in the Upper Blue River Basin would be maintained into the future. With a stronger push for mitigation by the Towns and the County, this project would allow for continuity in the type of mitigation that was performed and ensure that mitigation efforts are maintained into the future so that not only a residence benefits but the entire subdivision benefits from the efforts of the citizens.
Ideas for Implementation:	Community outreach and educations, changes in code language to enforce the Firewise type mitigation programs, mailers to HOAs
Responsible Agency:	Red, White, and Blue FPD
Partners:	Town of Blue River, Town of Breckenridge, Summit County
Potential Funding:	Rural Wildfire Funds, Summit County 1A money
Cost Estimate:	$3,000
Benefits: (Losses Avoided)	Continuity of mitigation among jurisdictions, maintenance of mitigation efforts for years to come, community actively participates in preparedness and mitigation efforts.
Timeline:	5 years
Status:	Continuing - In progress. Action added in 2013. The Fire District continues to work with HOAs to become Firewise Communities. Since 2013 we have added The Woods, Riverwood, and North Star Village HOAs to our list of communities.

Mitigation Action: Red, White, and Blue Fire District—8 Hazard Assessment for Critical Infrastructure

Jurisdiction:	Red, White, and Blue Fire District
Action Title:	Develop a threat and hazard assessment for each critical infrastructure in our District and identify risk reduction strategies.
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Medium
Background/Issue:	As part of our Community Risk Assessment and Standards of Cover, we have found a void in the information we have documented related to the critical infrastructure that we protect. This project would standardize the list of critical infrastructures across each jurisdiction and identify risks associated with each facility/location to perform an "all hazards" analysis.
Ideas for Implementation:	
Responsible Agency:	Red, White, and Blue FPD
Partners:	Town of Blue River, Town of Breckenridge, Summit County, Critical Infrastructure Representatives
Potential Funding:	District funds
Cost Estimate:	$5,000
Benefits: (Losses Avoided)	Consistency across jurisdictions on the critical infrastructure list. Development of a more complete Community Risk Assessment and Standards of Cover documents for our agency.
Timeline:	2-3 years
Status:	New in 2020

Mitigation Action: Red, White, and Blue Fire District—9 Response Plans for Critical Infrastructure and Key Resources

Jurisdiction:	Red, White, and Blue Fire District
Action Title:	Develop inspection strategies and response plans for locations identified as Critical Infrastructure or key resources in the community.
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Medium
Background/Issue:	We need to develop inspection strategies and train staff accordingly to handle these unique and technical inspections to protect the community. In addition, we need to look at the response capabilities in the community and develop dispatch protocols for response to these specific locations.
Ideas for Implementation:	
Responsible Agency:	Red, White, and Blue FPD
Partners:	Town of Blue River, Town of Breckenridge, Summit County, Critical Infrastructure Representatives
Potential Funding:	District funds
Cost Estimate:	$5,000
Benefits: (Losses Avoided)	Knowledgeable staff that understands the hazards associated with each infrastructure and tie that into our pre-incident plans. Dispatch protocols that match the hazard.
Timeline:	2-3 years
Status:	New in 2020

I.7 Implementation and Maintenance

Moving forward, the Districts will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the Fire Protection Districts to help inform updates and the development of the District's plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

Red, White and Blue Fire Protection District has included risk information from the 2013 plan and Fire Protection District's annex in the annual updates to the District's Community Risk Assessment: Standards of Cover document. Chapter IV All-Hazard Risk Assessment of the Community and specifically informs the Natural Risks section of the document.

While Summit Fire & EMS did not indicate integration of risk from the 2013 plan into the Districts plans, or codes directly, the information from the 2013 plan provided a general understanding of the risks and vulnerabilities that natural disaster may pose on people and structures within the District's boundaries.

Process Moving Forward

Moving forward, the Fire Protection Districts may use the vulnerability and risk information to help inform updates to future capital improvement planning for the Districts. For example, the Additional Response Station in Silverthorne mitigation action (SFE action #4) has been added to District Strategic Plan in 2019. RWBFP will continue to include risk information, including the information from this plan update process, in the District's annual Community Risk Assessment: Standards of Cover document, refer to Appendix A References.

The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Fire Protection Districts.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Summit Fire & EMS and the Red, White, and Blue Fire Protection Districts will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Monitoring, Evaluation and Updating the Plan

The Fire Protection Districts will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The districts will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The Deputy Chiefs for Summit Fire and & EMS and Red, White, and Blue Fire Protection District will be responsible for representing the Fire Protection Districts in the County HMPC, and for coordination with County staff and departments during plan updates. Summit Fire& EMS and the Red, White, and Blue Fire Protection District realize it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

Annex J: Copper Mountain Consolidated Metropolitan District

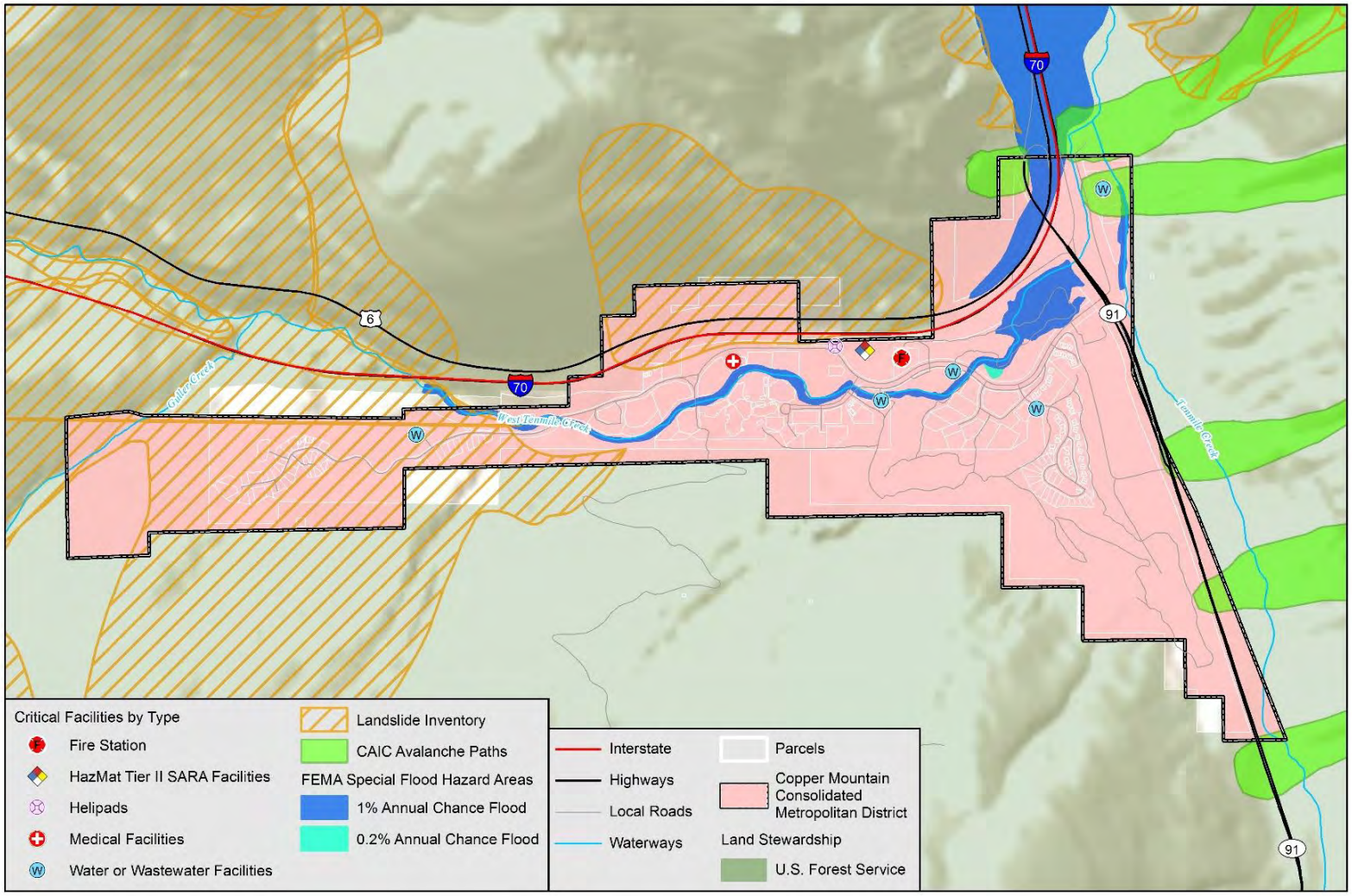
J.1 Community Profile

Copper Mountain Consolidated Metropolitan District (CMCMD) is a special district in Summit County. The CMCMD area was formerly known as Wheeler Junction. The Wheeler Junction settlement was founded in the 1880s and home to miners who worked in the copper mines. As was the case with other areas in Summit County, most of the old settlements decayed as the mining claims dried up. In 1971 Chuck Lewis came to the area and decided to build a ski area with construction beginning that same summer. In 1972 the Copper Mountain Consolidated Metropolitan District was formed to address the needs of the citizens of the area.

The Metro District oversees services such as water, sewer, sanitation, television, parks, and streets. Emergency services, including wildfire response, is handled by the Summit Fire & EMS Authority. The District operates under the direction of a five-person, elected Board of Directors. The Board sets policy decisions, which are carried out by CMCMD staff. The District Manager oversees roughly 22 full-time employees.

Figure J-1 shows the location of the Copper Mountain Consolidated Metropolitan District as well as all available local hazards. Critical facilities located within the district boundaries are also included.

Figure J-1 Copper Mountain Consolidated Metropolitan District



J.2 Hazard Identification and Profiles

Representatives of CMCMD identified the hazards that affect the District and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and planning significance specific to the District (see Table J-1). In the context of the countywide planning area, there are no hazards that are unique to CMCMD.

Table J-1 CMCMD—Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Highly likely	Limited	High
Dam Incidents	Large	Unlikely	Catastrophic	High
Drought	Large	Likely	Limited	Medium
Earthquake	Large	Occasional	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Flood	Small	Likely	Limited	Low
Hazardous Materials Release (Transportation)	Isolated	Likely	Critical	High
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Likely	Negligible	Medium
Lightning	Large	Highly Likely	Critical	High
Pest Infestation (Forest and Aquatic)	Large	Highly Likely	Limited	High
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Highly Likely	Catastrophic	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Highly Likely	Critical	High

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

J.3 Vulnerability Assessment

The intent of this section is to assess Copper Mountain Consolidated Metropolitan District's vulnerability separate from that of the planning area (i.e. Summit County) as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan.

District Asset Inventory

Table J-2 shows the total number of improved parcels, properties, and their improvement and content values for the District. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data (as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a

percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, 100% for Commercial structures, and 0% for Exempt and Vacant parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table J-2 CMCMD—Building Exposure

Parcel Type	Total Properties	Improved Value	Content Value	Total Value
Commercial	86	$47,091,106	$47,091,106	$94,182,212
Exempt	64	$0	--	$0
Residential	1,471	$750,004,503	$375,002,252	$1,125,006,755
Vacant	23	$33,742,101	--	$33,742,101
TOTAL	**1,644**	**$830,837,710**	**$422,093,358**	**$1,252,931,068**

Source: Summit County Assessor Data, DOLA, November 2019

Table J-3 lists summary information for the 10 critical facilities in the District that are important to protect in the event of a disaster. Table J-4 details more information on the critical facilities in question found in CMCMD. Note that there were several critical facilities the HMPC indicated should not be disclosed in terms of location or name, so while they were considered in the GIS analysis within each hazard's vulnerability assessment for planning purposes, they will not be described in detail nor will they be shown in any maps. As such, the detailed facility list only contains detailed information for 9 of the 10 facilities. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the base plan HIRA document.

Table J-3 CMCMD—Critical Facilities and Infrastructure

FEMA Lifeline	Critical Facility Type	Total
Communications*	Public Safety Transmitters	1
Food/Water/Shelter	Wastewater Facilities	5
Hazardous Materials	HazMat Tier II SARA Facilities	1
Health and Medical	Medical Facilities	1
Safety and Security	Fire Station	1
Transportation	Helipads	1
TOTAL		**10**

* This facility's location will not be disclosed, and no additional details will be provided.
Sources: Summit County, DOLA, HIFLD.

Table J-4 CMCMD—Details on Critical Facilities and Infrastructure

FEMA Lifeline	Critical Facility Type	Facility Name	Location/Notes
Safety and Security	Fire Station	Summit Fire Station 1	477 Copper Road, Copper Mountain 80443
Hazardous Materials	HazMat Tier II SARA Facilities	CenturyLink Communications - Copper Central Office	511 Copper Rd, Summit County 80443
Transportation	Helipads	Copper Mountain Helipad	
Health and Medical	Medical Facilities	Copper Mountain Clinic	
Food/Water/Shelter	Wastewater Facilities	Copper Mountain Wastewater Treatment	
		Copper Mountain Water Tank 750,000 gal	
		Copper Mountain Well	
		Copper Mountain Well	
		Copper Mountain Well	

Source: Summit County, DOLA, HIFLD.

Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan. Hazards available for mapping are represented in Figure J-1.

- Drought
- Earthquake
- Erosion/Deposition
- Hazardous Materials Release (Transportation)
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Only Avalanche, Dam Incidents, Flood, Landslide/Mudflow/Debris Flow/Rockfall, and Wildfire hazards will be profiled in the following vulnerability assessment sections, due to the ability to quantify vulnerability further with available data.

Avalanche

The Avalanche threat has potential to impact the District from major avalanches along Sky Chutes and chutes directly above Copper Mountain infrastructure. Of the ten Critical Facilities identified in Table J-3, the District has one wastewater treatment facility at risk of avalanche (the Copper Mountain Wastewater Treatment Plant). GIS analysis indicates potential risk to other developed properties, as shown in Table J-5.

Table J-5 Properties in CAIC Avalanche Path Areas – CMCMD

Property Type	Total Properties	Improved Value	Content Value	Total Value	Population
Exempt	3	0	--	0	--
TOTAL	3	0	0	0	0

Source: Summit County Assessor, CAIC, DOLA, U.S. Census, Wood analysis.

Dam Incidents

Existing Development

CMCMD could be impacted by failure of the Clinton Gulch dam. There are also tailings ponds in the southwestern corner of Summit County associated with molybdenum processing at the Climax mine near Fremont Pass. These structures include Ten Pond #3 and Mayflower Pond #5, both ranked as high hazard dams. Failure of these dams could release a debris flow towards the Copper Mountain Metro District area that would result in extensive public safety and environmental concerns.

Future Development

Flooding due to a dam failure event would likely exceed the special flood hazard areas regulated through local floodplain ordinances. CMCMD should consider the dam failure hazard when planning development downstream of a high or significant hazard dam, particularly critical facilities. Low hazard dams could become significant or high hazard dams if development occurs below them. Regular monitoring of dams, exercising and updating of EAPs, and rapid response to problems when detected at dams are ways to mitigate the potential impacts of these rare, but potentially catastrophic, events.

Flood

While the overall flood risk on Copper Mountain is rather limited, the District has two Commercial properties located in the 1% annual chance flood zone; as shown in Table J-6 over $5.5 million is at risk. The District does not have any properties in the 0.2% annual chance flood zone.

Table J-6 CMCMD Properties Vulnerable to 1% Annual Chance Flood Events

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% of Total Value)	Population
Commercial	2	$11,091,084	$11,091,084	$22,182,168	$5,545,542	--

Source: Summit County, DOLA, FEMA NFHL, U.S. Census Bureau, Wood analysis

Landslide, Mudflow/Debris Flow, Rockfall

There are 56 properties at risk of landslide in the CMCMD, with a total value of over $146 million, as shown in Table J-7.

Table J-7 Property Exposure to General Landslide Hazard Areas in Copper Mountain

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population
Commercial	1	$752,741	$752,741	$1,505,482	--
Exempt	3	$0	--	$0	--
Residential	51	$96,510,462	$48,255,231	$144,765,693	158
Vacant	1	$50,543	--	$50,543	--
TOTAL	56	$97,313,746	$49,007,972	$146,321,718	158

Source: Summit County GIS/Assessor Office, DOLA, Colorado Geological Survey, U.S. Census, Wood analysis

Wildfire

Existing Development

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which classifies areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in the District. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. Property improvements and estimated content values were then totaled to arrive at the Total Value column, which is also the estimated potential loss as wildfires typically result in complete loss to structure and contents. The District was found to intersect with wildfire areas rated as Medium and High, summarized by property type based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard of the Base Plan, and summarized for the District in Table J-8.

There are 814 properties falling in the Medium threat category with over $673 million at potential risk, mostly classified as residential. A total of 11 properties are located in High threat categories, with over $18.8 million in total values at risk, all residential properties.

Table J-8 CMCD - Property Values in Wildfire Zones by Parcel Type

Wildfire Hazard	Parcel Type	Total Properties	Improved Value	Content Value	Total Value and Loss Estimate	Population
High	Residential	11	$12,542,541	$6,271,271	$18,813,812	34
	TOTAL	11	$12,542,541	$6,271,271	$18,813,812	34
Medium	Commercial	56	$27,094,345	$27,094,345	$54,188,690	--
	Exempt	39	$0	--	$0	--
	Residential	711	$404,067,721	$202,033,861	$606,101,582	2,204
	Vacant	8	$12,725,556	--	$12,725,556	--
	TOTAL	814	$443,887,622	$229,128,206	$673,015,828	2,204
GRAND TOTAL		825	$456,430,163	$235,399,476	$691,829,639	2,238

Source: Summit County GIS/Assessor Office, DOLA, CO-WRAP, U.S. Census, Wood analysis

Of the ten Critical Facilities identified in Table J-3, all except the communications facility (public safety transmitter) are located in areas at Medium risk of wildfire.

Future Development

Wildland-urban interface (WUI) issues will continue to be a concern as CMCMD's population and development increase. A Planned Unit Development (PUD) amendment seeks to redistribute density in the District. Growth in existing developed areas, as opposed to new undeveloped areas, would help mitigate wildfire risk in the District.

Growth and Development Trends

After several years of limited development at Copper Mountain, several new development projects are currently underway as planned, including a new employee housing development located near the North Alpine lot, and a 127-room hotel at the Chapel Lot.

Plans are also underway to bring new community offerings to the Copper Mountain resort, including at the base of the Alpine lift in the resort's East Village, and at the Chapel and North Alpine Lots. The proposed "Alpine Neighborhood" at the base of the Alpine Lift is planned to include new construction single-family homes and townhomes and a new hotel with slope side accommodations and dining options open to the public. This project is seen as a way to set the bar for future, thoughtful development across the resort. The proposed plan for the Alpine Neighborhood reflects community input, minimizes environmental impacts, enhances the golf course, and will create a phenomenal asset for Copper Mountain Community residents and guests.

Growth in existing developed areas, as opposed to new undeveloped areas, would help mitigate vulnerability to hazards in the District. A new Planned Unit Development (PUD) is in the process of being approved by the County. No increase in overall density numbers is planned from the 2008 PUD. However, existing density will be concentrated more into the core and Union Creek areas of the resort. Structures that are currently 2 stories in height will be increased to 110 feet in height to increase density within that area.

J.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

Regulatory Mitigation Capabilities

Regulatory mitigation capabilities include the planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities. The District is governed under the policies and programs of Summit County, including its building codes and land use planning. Table J-9 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in CMCMD.

Table J-9 CMCMD—Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	Yes	CMDMD's Waste Water/ Water Master Plan is in place and is being updated. With the possibility of more concentrated density certain parts of the infrastructure may have to be updated. The existing water treatment plant is designed to handle full build out of Copper. However, sewer lines and water distribution may have to be augmented to service increased demand. The Fire Dept is preparing a Capital Improvement Plan for inclusion in the CMCMD Master Plan.
Zoning ordinance	Yes	Summit County Government, Copper PUD
Subdivision ordinance	Yes	Summit County Government, Copper PUD
Growth management ordinance	Yes	Summit County Government, Copper PUD
Floodplain ordinance	Yes	Summit County Government
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Summit County Government
Building code	Yes	Summit County Government
Fire department ISO rating	Yes	Summit Fire & EMS Authority
Erosion or sediment control program	Yes	Summit County Government
Stormwater management program	Yes	Copper Mountain Resort
Site plan review requirements	Yes	Summit County Government
Capital improvements plan	Yes	CMCMD Water/Wastewater in place and being reviewed. Fire Dept. in progress. CMR PUD
Economic development plan	Yes	Summit County Government
Local emergency operations plan	Yes	Summit County has an EOP. CMFD has SOG's. We should set EOP as a goal.
Avalanche Terrain Zoning	Yes	Summit County Government
Flood insurance study or other engineering study for streams	Yes	Summit County Government
Elevation certificates (for floodplain development)	Yes	Summit County Government
Clinton Dam, Climax Tailing Ponds Dam Breach Disaster Plan	Yes	Summit County Government

Administrative/Technical Mitigation Capabilities

Table J-10 identifies the personnel responsible for activities related to mitigation and loss prevention in CMCMD.

Table J-10 CMCMD—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Summit County Government	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Summit County Government CMCMD CMR	Tetra-Tech Engineering
Planner/engineer/scientist with an understanding of natural hazards	No	In house experience and expertise	
Personnel skilled in GIS	No	Summit County Government	
Full time building official	Yes	Summit County Government	
Floodplain manager	No-N/A	Summit County Government	
Emergency manager	Yes	Summit County Government	
Grant writer	No		
Other personnel	Yes	Summit County Government, CMCMD	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Summit County Government	
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Reverse 911, Summit County Communications Center	
Other		Summit County Government	

Fiscal Mitigation Capabilities

Fiscal mitigation capabilities are financial tools or resources that CMCMD could or already does use to help fund mitigation activities. CMCMD has identified the Summit County Wildfire Grant Program as a potential source of mitigation funding. Collaborative programs between Copper Mountain Inc., The Village Company, and CMCMD may pool resources to help fund mitigation projects in the future.

Mitigation Outreach and Partnerships

- Ongoing public education programs focusing on residential fire safety
- Ongoing education of Copper Mountain, Inc. (CMI) building managers, HOAs, restaurants, and other personnel on fire safety
- Fire drills at CMI-owned employee housing facilities

- The Copper Mountain Consolidated Metropolitan District Water Efficiency Plan highlights vulnerabilities to hazards such as drought and wildfires, and related infrastructure risks. This plan seeks to raise common themes and water saving opportunities to encourage partnership and collaboration between participating utilities and entities, particularly given the uniqueness of the district and its reliance on groundwater for supply (High Country Conservation Center, 2018b).
- Yearly fire inspections of all CMI and private buildings

Past Mitigation Efforts

- CMCMD is currently working on Firewise in conjunction with the adoption of the 2012 IFC and amendments.
- Two to three grants have been obtained by The Village Company, with assistance from CMCMD, to mitigate WUI issues in Lewis Ranch. This includes the CMCMD water storage tank and Lewis Ranch Pump House. CMCMD has been working with CMR to establish access to snowmaking water and guns in the summer to protect critical infrastructure from wildfire.

Additional projects may involve selective thinning of vegetation within forest service's permitted resort properties adjacent to privately owned lands and structures.

Opportunities for Enhancement

Based on the capability assessment, the CMCMD has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and DHSEM. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the District will lead to more informed staff members who can better communicate this information to the public.

J.5 Mitigation Goals and Objectives

CMCMD has adopted the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

J.6 Mitigation Actions

CMCMD identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: CMCMD—1 WUI Fuels Reduction Program

Jurisdiction:	CMCMD
Action Title:	Copper Mountain WUI fuels reduction program
Hazard(s) Mitigated:	Wildfire, Pest Infestation (forest)
Priority:	Medium
Issue/Background:	Fuels reduction utilizing removal of standing dead, dead fall, selective thinning, and creating firebreaks. This will be in conjunction with educational programs for HOAs and individual homeowners for fuel reduction on private property.
Ideas for Implementation:	Project will use a combination of CWPP grant monies, HOA funds, Copper Mountain Inc. (CMI) staff and funds, along with volunteer hours by homeowners to identify and remove excess fuels and promote forest health. Educational programs about mitigation and forest health to be implemented for owners and HOAs.
Responsible Agency:	Copper Mountain Inc., CMCMD, Copper Mountain Resort Association
Partners:	CMI, CMCMD, Summit County Wildfire Council, USDS, CSFS, CSU Extension Office
Potential Funding:	Summit County Wildfire Council grants and collaboration among HOAs, CMI, and Copper Mountain Resort Association
Cost Estimate:	$3,000 - $5,000 per acre
Benefits: (Losses Avoided)	Reduction in risk to life safety and structural loss
Timeline:	Annual Implementation
Status:	Action added in 2013. Controlled burns of slash piles in Lewis Ranch completed in 2019.

Mitigation Action: CMCMD—2 Enhanced Public Notification

Jurisdiction:	CMCMD
Action Title:	Enhanced public notification through cable network
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Low
Issue/Background:	The Copper Mountain Resort Area does not have an Emergency Alert System to warn and inform residents and guests of an emergency. By utilizing software/hardware upgrades that would enable emergency messaging across the cable TV network, faster notification could occur.
Ideas for Implementation:	Software/hardware improvements and installation at the cable system's "head end" will upgrade the ability to notify residents and guests of emergencies.
Responsible Agency:	CMCMD – Dave Arnesan, Resortnet
Partners:	Summit County Alert, Resortnet, CMCMD
Potential Funding:	Grants, CMI, CMCMD
Cost Estimate:	$10,000 - $20,000
Benefits: (Losses Avoided)	Quicker notification for life safety emergencies
Timeline:	1 year
Status:	In progress. Action added in 2013

Mitigation Action: CMCMD—3 Replace Culverts

Jurisdiction:	CMCMD
Action Title:	Replace Copper Road West Tenmile culverts and Copper Circle West Tenmile culverts
Hazard(s) Mitigated:	Flood
Priority:	Low
Issue/Background:	Replace culverts with designed free span bridges. Ice buildup has plugged the culverts on the upstream side and spring runoff flows can produce too much stream flow for the culverts to handle leading to over topping and flooding across Copper Road and Copper Circle. Both hazards have required sand bagging to prevent overtopping and pavement damage.
Ideas for Implementation:	Collaborative improvements will involve CMCMD, Copper Mountain Inc., and Summit County Road and Bridge. Existing and new structures may have to be re-designed to prevent potential flooding issues. Also, road and bridge weight limits need to reflect requirements as set by the International Fire Code.
Responsible Agency:	Summit County Road and Bridge
Partners:	Powdr Corp./Copper Mountain and CMCMD
Potential Funding:	Summit County Road and Bridge
Cost Estimate:	$500,000 - $600,000
Benefits: (Losses Avoided)	Reduce or eliminate ice buildup and flooding potential both during the winter and at spring runoff
Timeline:	Two to five years
Status:	In progress. Action added in 2013

Mitigation Action: CMCMD—4 Community Wildfire Protection Planning

Jurisdiction:	CMCMD
Action Title:	Community wildfire protection planning
Hazard(s) Mitigated:	Wildfire
Priority:	Medium
Issue/Background:	Educating the public on how to mitigate their property. Encouraging the public on creating and maintaining defensible space. Raise community awareness on wildland urban interface.
Ideas for Implementation:	Participate in the Ready, Set, Go and FIREWISE programs. Create an annual community educational event. Attend Copper Events to increase public interaction at such affairs. Website information access as well as use of our newsletter. Solidify relations with property management companies to train their employees on wildfire awareness.
Responsible Agency:	Copper Mountain Fire Department (Steve Boyle)
Partners:	CSU Extension Program/ Copper Homeowners Association/ Copper Mountain Incorporated/ Summit County/ Summit County Wildfire Council
Potential Funding:	Summit County Wildfire Council/ CMCMD/ CMI/ Copper Mountain Resort Association/ Copper Chamber
Cost Estimate:	$5,000
Benefits: (Losses Avoided)	Reduction in loss of life and property.
Timeline:	Annual Implementation
Status:	Action added in 2013

Mitigation Action: CMCMD—5 Avalanche Mitigation and Reduction

Jurisdiction:	CMCMD
Action Title:	Avalanche mitigation, prevention and reduction work.
Hazard(s) Mitigated:	Avalanche
Priority:	High
Issue/Background:	Major Avalanches along Sky Chutes and Chutes directly above Copper Mountain infrastructure. Monitoring of potential or impending slide locations in vicinity of Copper Mountain and as required coordination with appropriate agencies to conduct avalanche mitigation operations (controlled blasting) or other methods to reduce the likelihood of a major avalanche event. During the winter of 2019 several avalanches occurred along Sky Chutes, Bucks Chute and the Poop Chute. The slides brought snow and debris down the mountains and knocked out gas lines and caused damage to the wastewater plant facilities. It also shut down the only public gas station in the area facilities.
Ideas for Implementation:	
Responsible Agency:	CMCMD
Partners:	Copper Mountain Resort, CDOT, CAIC, Summit County, USFS
Potential Funding:	HMA Grants
Cost Estimate:	$3,000-$30,000
Benefits: (Losses Avoided)	Prevents damage to key infrastructure, community protection, helps keep and I-70 HW91 lines of communication and transit open.
Timeline:	Ongoing project during winter months depending on snowpack and snow loads on mountains.
Status:	New in 2020

J.7 Implementation and Maintenance

Moving forward, the District will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the Metropolitan District to help inform updates and the development of District plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

The District did not integrate the 2013 risk information into current planning or regulation documents, but it did give a general awareness of the District's vulnerabilities to natural hazards and the need of mitigation projects to protect the District's critical facilities and lessen the impacts of hazard events.
Process Moving Forward

Moving forward, the District may use the vulnerability information to understand the hazards that pose a risk and specific vulnerabilities in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Copper Mountain Consolidated Metropolitan District area.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from the Copper Mountain Consolidated Metropolitan District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Monitoring, Evaluation and Updating the Plan

The Copper Mountain Consolidated Metropolitan District will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The District will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The District Manager will be responsible for representing the Metropolitan District in the County HMPC, and for coordination with County staff and departments during plan updates. The Copper Mountain Consolidated Metropolitan District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

Annex K: Denver Water

K.1 Community Profile

Denver Water proudly serves high-quality water and promotes its efficient use to 1.4 million people in the city of Denver and many surrounding suburbs. Established in 1918, the utility is a public agency funded by water rates and new tap fees, not taxes. It is Colorado's oldest and largest water utility.

Dillon Dam, located in Summit County, is a critical part of the Denver Water collection system, however, Summit County is not a part of the Denver Water's service area. Refer to the countywide maps in Chapter 3 and in Annex A.

K.2 Hazard Identification and Profiles

Representatives of Denver Water identified the hazards that affect the Denver Water's properties in Summit County and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and planning significance specific to Denver Water properties and its facilities (see Table K-1). In the context of the countywide planning area, there are no hazards that are unique to Denver Water.

Table K-1 Denver Water—Hazard Summary

Hazard Type	Geographic Location*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Highly Likely	Limited	Low
Dam Incidents	Small	Unlikely	Catastrophic	Medium
Drought	Large	Likely	Critical	High
Earthquake	Large	Occasional	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Flood	Small	Likely	Critical	High
Hazardous Materials Release	Isolated	Unlikely	Catastrophic	Medium
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Occasional	Critical	Medium
Lightning	Small	Likely	Critical	Medium
Pest Infestation (Forest and Aquatic)	Large	Likely	Critical	High
Severe Winter Weather	Large	Highly Likely	Critical	Medium
Wildfire	Medium	Highly Likely	Catastrophic	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low

*See Section 3.2 for definitions of these factors

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles in the body of this document.

K.3 Vulnerability Assessment

The intent of this section is to assess Denver Water's vulnerability separately from that of the planning area as a whole, which has already been addressed in Section 3.3 Vulnerability Assessment in the main plan. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment.

Denver Water's Asset Inventory in Summit County

Table K-2 lists critical facilities and other community assets identified by Denver Water as important to protect in the event of a disaster.

Table K-2 Denver Water—Critical Facilities and Other Community Assets

Name of Asset	Hazard Specific Info/Comments
Dillon Dam	Dam Failure, Drought, Earthquake
Robert's Tunnel	Earthquake

Source: Denver Water

Vulnerability by Hazard

This section examines assets at risk to hazards ranked that vary from the risks facing the entire planning area and estimates potential losses. Denver Water's exposure to most hazards in Summit County does not differ significantly from that of the County as a whole, but the focus of vulnerability assessment is on those hazards that have the potential to impact the District's water infrastructure.

Dam Incidents

Dillon Dam is a critical part of the Denver Water's Collection System and is used for storage. The dam was not constructed as a "flood control dam". The dam is classified as a high hazard dam that has the potential to impact Silverthorne and other downstream areas. The likelihood and impacts of an incident at Dillon Dam are discussed in Section 3.2.2. Failure of the dam is unlikely but would have extensive consequences both in terms of economic losses to Denver Water, as well as the loss of the water resource for a period of time. Outside of potential effects to Denver Water infrastructure, failure of the dam would also result in damage to downstream communities and property and potential loss of life. Dillon reservoir could also be impacted by failure of dams in the Blue River and Tenmile watersheds. Depending on the type or severity of the incident, this could result in water quality impacts and possibly lead to spillway flows or concerns for the integrity of the Dillon Dam.

High Flow Releases from Dillon Dam (>10-year recurrence)

One of the more significant hazards to the public would be high flow releases out of Dillon Dam due to large natural inflows due to heavy snow and/or inclement weather, though it is highly unlikely there would be more released than what is coming in naturally.

The downstream floodplain in the Town of Silverthorne and Summit County is highly developed, and Denver Water has witnessed flooding impacts around the 10-year recurrence interval discharge (high probability, significant magnitude). Denver Water has invested time working with the Town of Silverthorne and Summit County to inform the communities of these risks, including significant public outreach efforts related to high flows.

Flood

The Planning Area below the dam, is prone to high flows along the rivers from heavy snowmelt runoff and intense rainfall. When significant runoff rain and events occur, Denver Water is responsible for managing Dillon Dam to maintain reservoir capacity, including releasing water to relieve pressure on the dam structure. This could result in high flows in communities such as Silverthorne, which have become highly developed in the floodplain downstream of Dillon Dam.

Drought / Water Shortage

The most significant impacts associated with drought and water shortage for Denver Water are those related to water intensive activities such as wildfire protection and municipal usage. Denver Water will utilize their Water Shortage Response Plan during water shortage events. This plan contains progressive stages that can be enacted. These stages contain voluntary and mandatory conservation measures in addition to specific curtailments of water usage for specific industries. Denver Water uses various indicators when deciding to enact restrictions. These indicators include geographical, environmental and economic conditions on the western slope. An important note is restrictions and subsequent reductions in usage will not increase water in streams and waterways in Denver Water's collection system. Revenue shortages, water quality issues and recycled water availability are all potential impacts during water shortage events. In addition, a lack of available water can also lower reservoir levels, which exposes more shoreline to erosion. This can result in increased water treatment costs. During an extraordinary, long-term water shortage event, hydropower availability may be at risk.

Pest Infestation (Forest/Aquatic)

Aquatic infestations of the zebra and quagga mussels have been found in waterways across the western United States. In Summit County they have been found in the past in the Green Mountain Reservoir and have posed a threat to Dillon Reservoir. Both are multiuse reservoirs opened to recreational activities such as boating, which is a leading cause of bringing the invasive mussels into waterways.

While the mussels or aquatic nuisance species haven't been found in Dillon Reservoir, Denver Water pays for boat inspectors who are trained in identifying aquatic nuisance species training to inspect all boats prior to entering the water, especially if from out of state. According to the HMPC in addition to boats kayaks are also a concern for infestation.

In August 2017, the quagga mussel was found in the Green Mountain Reservoir after years of being threatened by the invasive species and monitoring of the reservoir. Since 2017, the Reservoir is considered a 'suspect' reservoir for infestation. Between 2008 and 2017, eight total reservoirs in Colorado were confirmed to have mussel's present including the Willow Creek and Shadow Mountain Lake in neighboring Grand County.

Various beetle epidemics over the years have affected the watershed and contributed to fuel loading for wildfires.

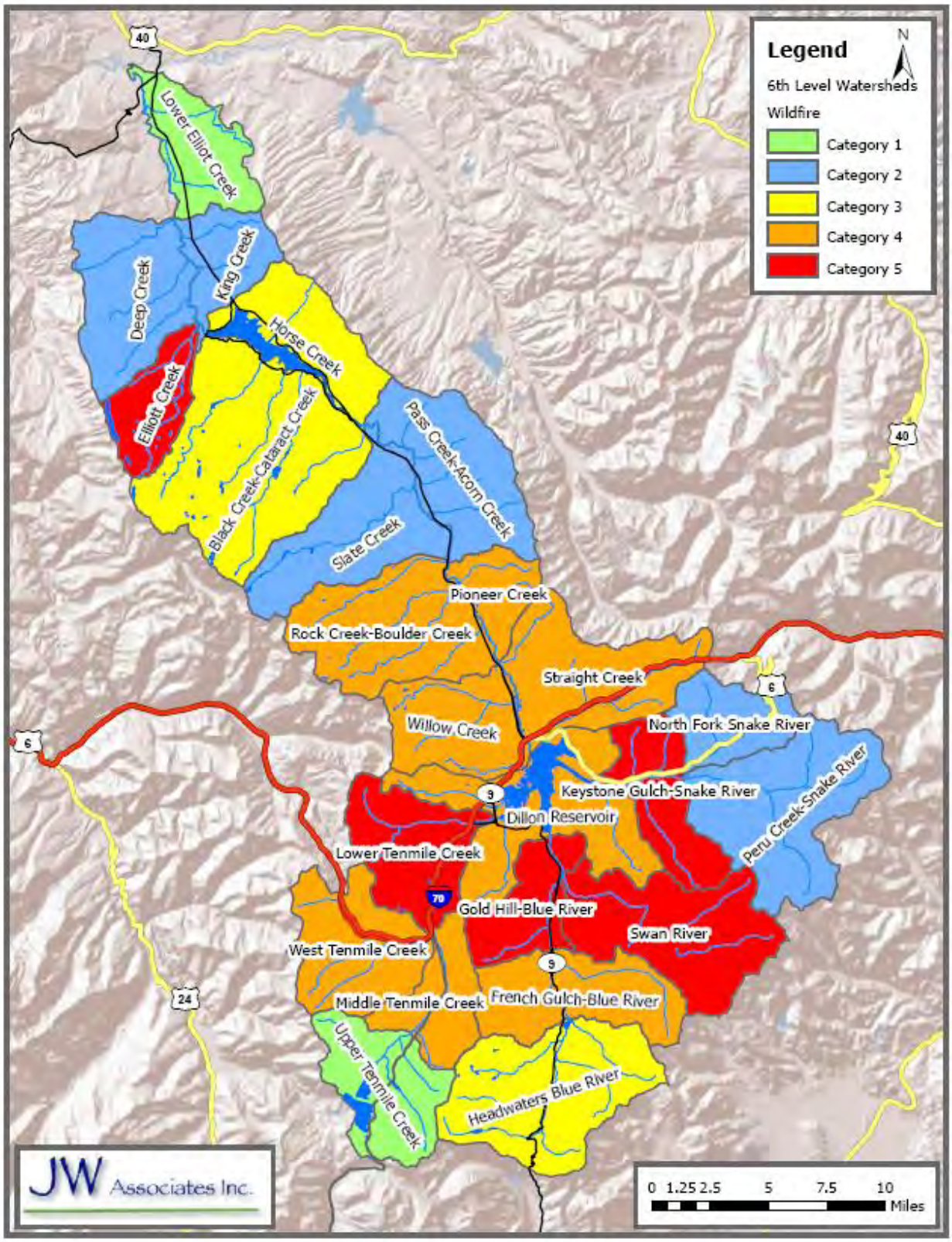
Wildfire

Watersheds and the numerous associated reservoirs in the county could be significantly impacted by high severity wildfire, which could have cascading impacts on water quality and Denver Water infrastructure. For example, the damage to Strontia Springs Reservoir caused by siltation from the 1996 Buffalo Creek Fire took fifteen years to complete and cost Denver Water over $30 million.

Watersheds on the steep western slope of the Front Range feed directly into reservoirs and are of highest concern for wildfire impacts. The Blue River Wildfire/Watershed Assessment (JW Associates, Inc. 2011) "identifies and prioritizes sixth-level watersheds based on their hazards of generating flooding, debris flows, and increased sediment yields following wildfires that could have impacts on water supplies" (pg. 1). Figure K-1 shows the Blue River watershed wildfire hazard ranking.

Watersheds can be considered as assets in their own right. Consultation with those water supply agencies with facilities, reservoirs, and properties should be included in mitigation discussions, and are in fact required to take part since the passage of Colorado House Bill 09-1162. Further consultation with members of a Burned Area Emergency Response Team may provide further guidance in mitigating and preparing for the effects of wildfire in a watershed.

Figure K-1 Blue River Watershed Wildfire Hazard Ranking



Source: JW Associates, Inc., Blue River Wildfire/Watershed Assessment 2011

Continued growth of Summit County's population will generally mean an expanded WUI and potential exposure of buildings and people. It is important that CWPPs, EOPs, and other planning documents and regulations remain current to ensure improved community adaptation to the fire prone environment in which they are being built. Denver Water is working with local offices of emergency management, including Summit County, to address wildfire hazards.

Growth and Development Trends

Denver Water does not have authority to manage growth or development within its district outside of Denver Water property. As the population continues to grow in Summit County, but more importantly the Front Range, so too will the demand for water growth and reliance on Denver Water assets, particularly during times of drought.

K.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

Regulatory Mitigation Capabilities

Regulatory mitigation capabilities include the planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities. Table K-3 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Denver Water. Many of the regulatory capabilities used by local jurisdictions are not applicable to Denver Water.

Table K-3 Denver Water—Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	N/A	
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Growth management ordinance	N/A	
Floodplain ordinance	N/A	
Other special purpose ordinance (stormwater, steep slope, wildfire)	N/A	
Building code	N/A	
Fire department ISO rating	N/A	
Erosion or sediment control program	N/A	

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Stormwater management program	N/A	
Site plan review requirements	N/A	
Capital improvements plan	Yes	
Economic development plan	N/A	
Local emergency operations plan	Yes	Denver Water Emergency Operations Plan developed in 2012, reviewed and updated on regular basis
Other special plans	Yes	Drought Response Plan Watershed Management Plan Crisis Communications Plan Climate Adaptation Plan Integrated Resource Plan FERC Emergency Action Plans (EAPs) on all dams. EPA Emergency Response Plans (ERPs) treatment and distribution plans. Continuity of Operations Plans Facility Security Plans
Flood insurance study or other engineering study for streams	N/A	
Elevation certificates (for floodplain development)	N/A	
Other		

Administrative/Technical Mitigation Capabilities

Table K-4 identifies the personnel responsible for activities related to mitigation and loss prevention in Denver Water.

Table K-4 Denver Water—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	yes	External Affairs	Watershed Scientist
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering	
Planner/engineer/scientist with an understanding of natural hazards	Yes	External Affairs	Drought planners Watershed Scientist
Personnel skilled in GIS	Yes	IT/GIS	
Full time building official	N/A		
Floodplain manager	N/A		
Emergency manager	Yes	Emergency Management Section	
Grant writer	No		

Personnel Resources	Yes/No	Department/Position	Comments
Other personnel	Yes	Water resource engineers and drought planners	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	IT/GIS	
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	IT /Local Dispatch Centers	Internal Warning Systems/Services: Everbridge System Controls Denver Water is responsible for managing the water system and will notify first response agencies when emergencies arise External: Local Systems. First Response Agencies are responsible for notifying their populations of impacting emergencies
Other	Yes	Boat Inspectors	Trained inspectors look at each boat and kayak for signs of Aquatic Nuisance Species before they are allowed to enter Dillon Reservoir.

Fiscal Mitigation Capabilities

Fiscal mitigation capabilities are financial tools or resources that Denver Water could or already does use to help fund mitigation activities. Denver Water has received funding for forest management and watershed health improvements through the Colorado State Forest Service and U.S. Forest Service (USFS)

Mitigation Outreach and Partnerships

Denver Water has various outreach and partnerships including public education programs related to water conservation, drought response, water quality, and a very active youth education program focusing on a variety of water-related topics.

Coordination Efforts include:

- Denver Water's External Affairs division consists of Customer Relations, Communications & Marketing, Government & Stakeholder Relations, Conservation, Treated Water Planning, Demand Planning and Water Resources. This group provides a plethora of planning and outreach with local partners. They provide media relations, social media, marketing, publications, internal communication, stakeholder relations, government relations, community outreach, and website communications for both our combined service area of 1.4 million people and for the communities where Denver Water's

watersheds and facilities are located. Denver Water is an active participant in the Summit County Wildfire Council and leverages the From Forests to Faucets Partnership with the County's Strong Future Funds administered through the Council.

- Denver Water's Emergency Management, Safety & Security section partners with local OEMs and local law enforcement agencies to work closely on planning, response, recovery and mitigation efforts in order to build a resilient community that can respond to emergencies, to share public safety messages around flood/runoff safety, to create a culture of preparedness and foster an understanding of Denver Water's operations and constraints.

Denver Water uses the following communication and coordination methods to conduct public outreach:

- "Dillon Dam Outflows" community e-newsletter
- Dillon Dam Spring runoff committee
- Dillon Dam Security Taskforce committee
- Direct mail/collateral to at-risk property owners downstream of Dillon (e.g., post cards promoting local EM resources and sign-ups for our e-newsletter).
- TAP stories, videos and infographics across all social media channels, which provide content and opportunities for local partners to adapt for use on their social media channels.
- Partnerships with County Emergency Management and offering content for their annual safety guide
- Presentations to community groups, the annual State of the River event, Emergency Manager's Town Halls, etc.
- Expert interview(s) on local PATV station.
- Proactive media pitches to local publications and websites.

Past Mitigation Efforts

Denver Water has partnered with local emergency management agencies to participate in local emergency management programs – planning (i.e., hazard mitigation planning), training and exercises; response, recovery and mitigation efforts. Denver Water has incorporated the FEMA process for plan development including after-action reviews and improvement items all to enhance the planning, response and mitigation efforts in order to build a resilient utility. Denver Water has partnered with the U.S. Forest Service to improve forest and watershed conditions in parts of Colorado by implementing hazardous fuels treatments and removing hazardous biomass. Forests play a role in protecting areas important to surface drinking water. USFS maps these areas using GIS before working with Denver Water on fuels treatment projects. This effort is part of the From Forests to Faucets Program.

Opportunities for Enhancement

Based on the capability assessment, Denver Water has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for Denver Water to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Colorado Division of Homeland Security and Emergency Management (DHSEM) or the Colorado Water Conservation Board (CWCB). Additional training opportunities will help to inform staff

and board members on how best to integrate hazard information and mitigation projects into Denver Water policies and ongoing duties. Continuing to train Denver Water staff on mitigation and the hazards that pose a risk to the district will lead to more informed staff members who can better communicate this information to the public. Another opportunity for enhancement includes continued relationship building with county and local government staff to raise awareness of preparedness resources and mitigation techniques in the event of high-water flows.

K.5 Mitigation Goals and Objectives

Denver Water has adopted the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

K.6 Mitigation Actions

Denver Water identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: Denver Water—1 Update Drought Management Plan

Jurisdiction:	Denver Water
Action Title:	Update drought management plan
Hazard(s) Mitigated:	Drought
Priority:	High
Issue/Background:	Updating the drought management plan will allow Denver Water to identify risks to their infrastructure and critical facilities and reduce the impacts of water shortages.
Ideas for Implementation:	
Responsible Agency:	Denver Water
Partners:	CWCB
Potential Funding:	
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Reduce drought impacts to people and critical facilities; build resiliency to drought.
Timeline:	Ongoing
Status:	Continue- Not Completed. Action added in 2013

Mitigation Action: Denver Water—2 Public Outreach in Summit County

Jurisdiction:	Denver Water
Action Title:	Public outreach efforts in Summit County
Hazard(s) Mitigated:	Multi-Hazard
Priority:	Low
Issue/Background:	The Denver Water government stakeholder group would like to partner with Summit County stakeholders to rebuild relationships and provide networking and education for the public. Denver Water OEM has additional ideas and information on public education efforts as they related to FERC requirements.
Ideas for Implementation:	Summit County Strategic Comms Plan used to assist with alert/notification, response efforts and overall information sharing.
Responsible Agency:	Denver Water Emergency Management
Partners:	Summit County OEM, participating jurisdictions
Potential Funding:	Denver Water
Cost Estimate:	Staff time, developing and printing public information materials.
Benefits: (Losses Avoided)	Strengthen partnership between Denver Water and Summit County; keep public informed.
Timeline:	Ongoing
Status:	Continue – Not completed. Action added in 2013. Refer to Summit County Strategic Communications Plan to assist with alert/notification, response efforts and overall information sharing.

Mitigation Action: Denver Water—3 GIS Mapping Coordination Project

Jurisdiction:	Denver Water
Action Title:	Develop GIS mapping coordination project to show damages based on dam EAPs, flood maps, and county floodplains
Hazard(s) Mitigated:	Dam Failure
Priority:	Low
Issue/Background:	COEM is in the process of developing a "reference guide" for all 600+ dams in Colorado for local emergency managers to access and use for local planning efforts. Denver Water has inundation maps, included in their AOP for local officials to use in order to develop local notification and evacuation plans.
Ideas for Implementation:	
Responsible Agency:	Denver Water
Partners:	COEM, CO DNR – Division of Water Resources, Summit County
Potential Funding:	Denver Water
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Improve dam failure notification and evacuation procedures in Summit County; protect life safety
Timeline:	
Status:	**Completed.** Action added in 2013.

Mitigation Action: Denver Water —4 Watershed Management Program: From Forests to Faucets Partnership

Jurisdiction:	Denver Water
Action Title:	Watershed Management Program: Forests to Faucets Partnership
Hazard(s) Mitigated:	Multi-Hazard, Wildfire, Flood, Drought, Pest Infestation (Forest and Aquatic)
Priority:	High
Issue/Background:	Denver Water has committed funding through the Forests to Faucets Partnership for forest treatments and wildfire risk reduction activities in priority watersheds. This funding is administered and matched by USFS and CSFS as part of the Partnership and can be used on National Forest and non-federal lands.
Ideas for Implementation:	Coordinate with Summit County Wildfire Council
Responsible Agency:	Denver Water
Partners:	USFS and CSFS
Potential Funding:	Denver Water. Approximately $1 million per year – can vary
Cost Estimate:	Project dependent.
Benefits: (Losses Avoided)	Wildfire risk reduction and forest resiliency in priority watersheds for drinking water supply and community protection.
Timeline:	Partnership/watershed management started in 2010 and timelines goes through 2022
Status:	New in 2020. In progress, began in 2010.

Mitigation Action: Denver Water —5 Runoff Season Public Education and High Flow Awareness

Jurisdiction:	Denver Water
Action Title:	Implement Summit County Runoff Season Safety Strategy Communications Plan
Hazard(s) Mitigated:	Flood
Priority:	Low
Issue/Background:	Through continued education and awareness, we'll contribute to a preparedness culture in Summit County where at-risk property owners better understand Denver Water's operations and constraints, and their place on the flood risk spectrum.
Ideas for Implementation:	Summit County Strategic Communications Plan used to assist with alert/notification, response efforts and overall information sharing.
Responsible Agency:	Denver Water Public Affairs
Partners:	Summit County OEM
Potential Funding:	Denver Water
Cost Estimate:	Project dependent.
Benefits: (Losses Avoided)	Alert, notification to local first response community for emergency action items and information sharing.
Timeline:	Ongoing
Status:	New in 2020

K.7 Implementation and Maintenance

Moving forward, Denver Water will manage their identified mitigation projects through normal business practices, to track progress of projects. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by Denver Water to help inform updates and the development of District plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

While Denver Water did not directly integrate risk information from the 2013 into existing planning mechanisms, through various planning committees, Denver Water did review and edit the 2013 mitigation plan and have incorporated improvement in this iteration of the Denver Water annex.

Process Moving Forward

Moving forward, Denver Water may use the vulnerability information to help inform updates and understanding of the hazards that pose a risk and the specific vulnerabilities to the jurisdiction in future capital improvement planning for Denver Water area in Summit County.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from Denver Water will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Monitoring, Evaluation and Updating the Plan

Denver Water will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. Denver Water will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. Denver Water Manager of Emergency Management will be responsible for representing the District in the County HMPC, and for coordination with County staff and departments during plan updates. Denver Water realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

Annex L: Water and Sanitation Districts

L.1 Community Profile

The following water and water & sanitation districts participated in the 2020 update process for the Summit County Multi-Hazard Mitigation Plan:

- Dillon Valley District
- East Dillon Water District
- Mesa Cortina Water and Sanitation District, and
- Snake River Water District.

Dillon Valley is a Metropolitan District that provides water and sanitation services.

Figure L-1, Figure L-2, Figure L-3, and Figure L-4 show the location of the districts listed above (in that order) as well as all available local hazards. Critical facilities found within each of the district boundaries are also included.

Figure L-1 Dillon Valley District and Local Hazards

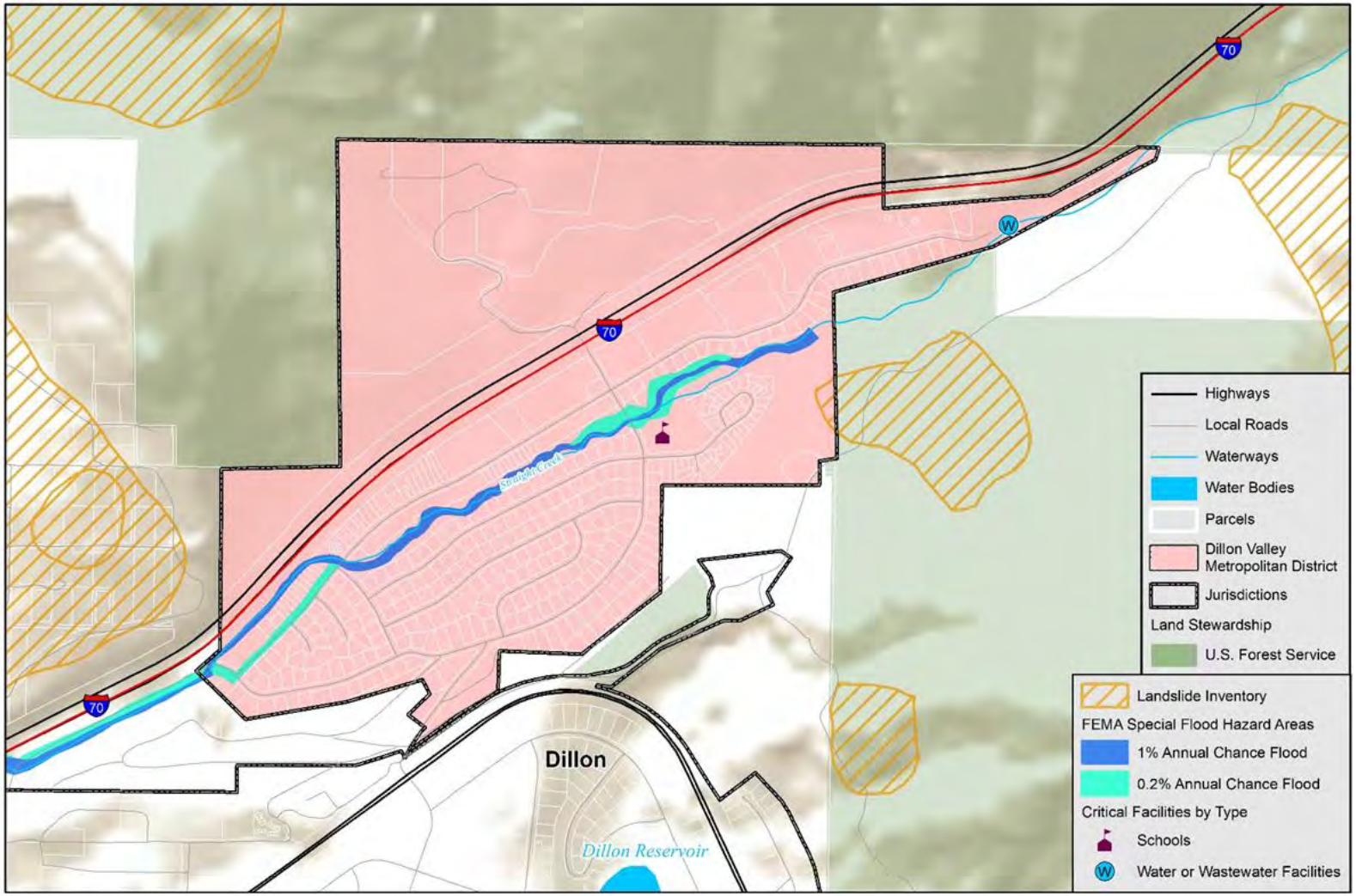


Figure L-2 East Dillon Water District and Local Hazards

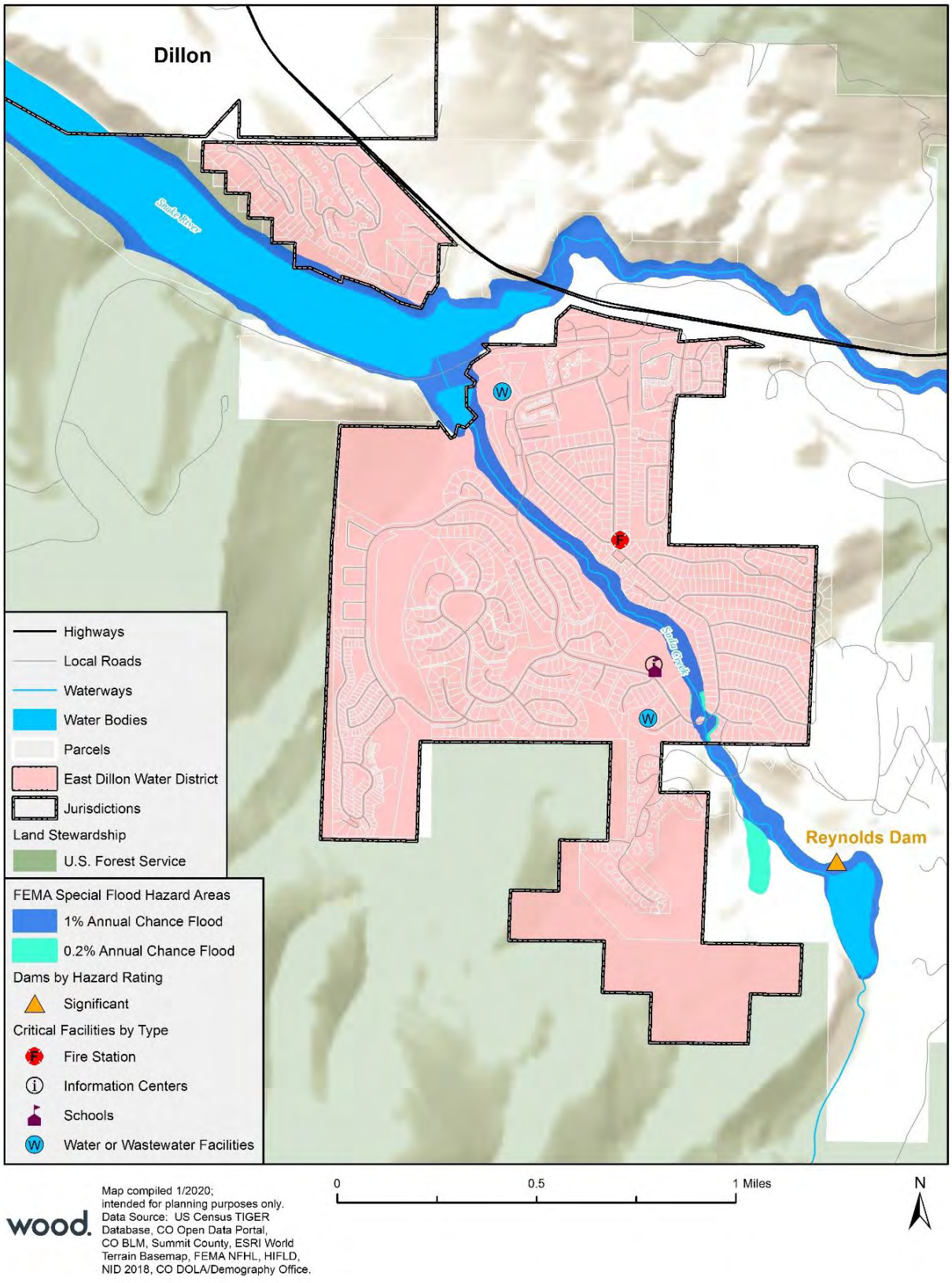


Figure L-3 Mesa Cortina Water and Sanitation District and Local Hazards

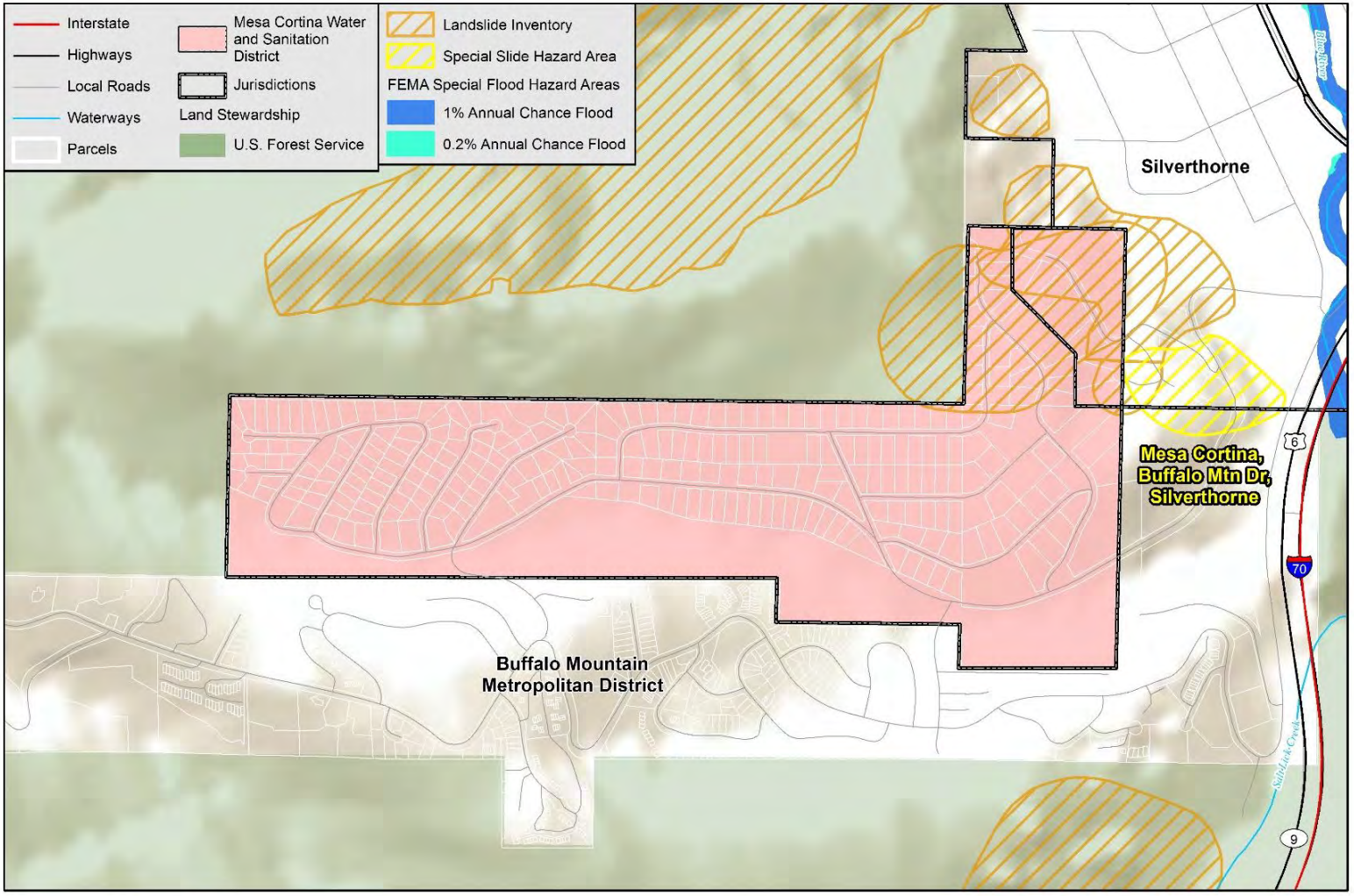
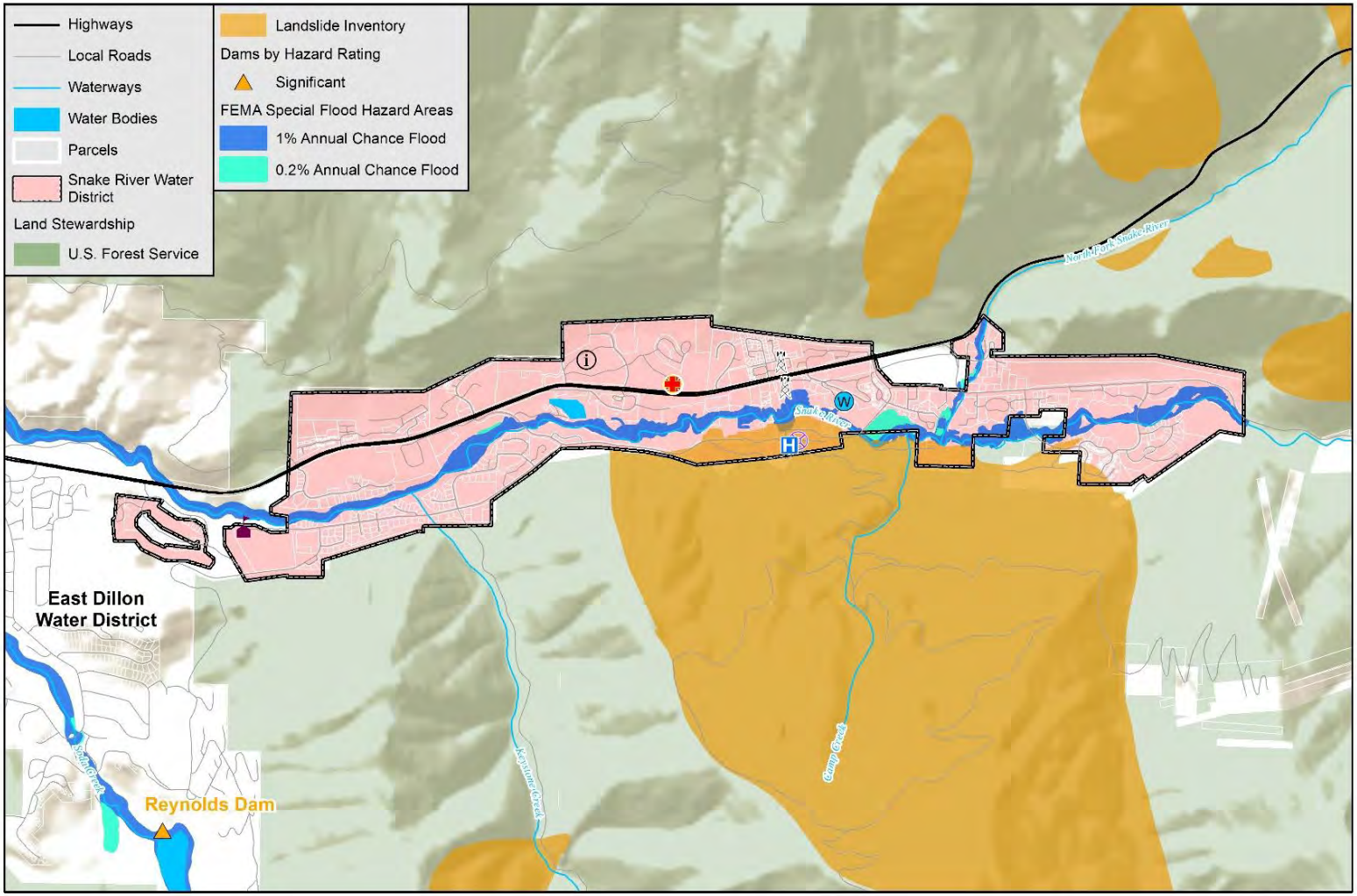


Figure L-4 Snake River Water District and Local Hazards



L.2 Hazard Identification and Profiles

Representatives of the districts in this annex identified the hazards that affect them and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and planning significance specific to the Town (see Table L-1). In the context of the countywide planning area, there are no hazards that are unique to these districts.

Table L-1 Water and Water & Sanitation Districts—Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Dillon Valley District				
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Incidents	Medium	Unlikely	Critical	Medium
Drought	Large	Likely	Negligible	Medium
Earthquake	Isolated	Occasional	Limited	Low
Erosion/Deposition	Isolated	Unlikely	Negligible	Low
Flood	Medium	Likely	Critical	High
Hazardous Materials Release (Transportation)	Small	Likely	Limited	High
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Occasional	Limited	Medium
Lightning	Large	Highly Likely	Negligible	Low
Pest Infestation (Forest and Aquatic)	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low
East Dillon Water District				
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Incidents	Medium	Unlikely	Critical	Low
Drought	Large	Likely	Negligible	Medium
Earthquake	Isolated	Occasional	Limited	Low
Erosion/Deposition	Isolated	Unlikely	Negligible	Low
Flood	Medium	Likely	Critical	High
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Negligible	Low
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Unlikely	Negligible	Low
Lightning	Isolated	Highly Likely	Negligible	Low
Pest Infestation (Forest and Aquatic)	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low
Mesa Cortina Water and Sanitation District				
Avalanche	Isolated	Unlikely	Negligible	Low

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Dam Incidents	Isolated	Unlikely	Limited	Low
Drought	Large	Likely	Negligible	Medium
Earthquake	Isolated	Occasional	Limited	Low
Erosion/Deposition	Isolated	Unlikely	Negligible	Low
Flood	Isolated	Unlikely	Negligible	Low
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Negligible	Low
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Unlikely	Negligible	Low
Lightning	Isolated	Highly Likely	Negligible	Low
Pest Infestation (Forest and Aquatic)	Large	Likely	Limited	Low
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low
Snake River Water District				
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Incidents	Isolated	Unlikely	Negligible	Low
Drought	Large	Likely	Negligible	Medium
Earthquake	Isolated	Occasional	Limited	Low
Erosion/Deposition	Isolated	Unlikely	Negligible	Low
Flood	Small	Likely	Limited	Medium
Hazardous Materials Release (Transportation)	Isolated	Likely	Critical	High
Landslide, Mudflow/Debris Flow, Rockfall	Isolated	Likely	Critical	Medium
Lightning	Isolated	Highly Likely	Negligible	Low
Pest Infestation (Forest and Aquatic)	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles of the main plan.

L.3 Vulnerability Assessment

The intent of this section is to assess the water and water & sanitation districts' vulnerability separately from that of the planning area as a whole, which has already been addressed in Section 3.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan.

District Asset Inventory

A parcel exposure summary of the properties across Summit County has been included in the main Hazard Identification and Risk Assessment (HIRA) document of this plan.

Table L-2 lists critical facilities and infrastructure assets identified by each district as important to protect in the event of a disaster.

Table L-2 Water and Water & Sanitation Districts—Critical Facilities and Other Community Assets

Special District	FEMA Lifeline	Critical Facility Type	Total
Dillon Valley District	Food/Water/Shelter	Wastewater Facilities	1
	Other/Schools	Schools	1
		TOTAL	**2**
East Dillon Water District	Communications	Information Centers	1
	Food/Water/Shelter	Water Treatment/Wastewater Facilities	2
	Other/Schools	Schools	1
	Safety and Security	Fire Station	1
		TOTAL	**5**
Mesa Cortina Water and Sanitation District	n/a	n/a	0
		TOTAL	**0**
Snake River Water District	Communications	Communications/Cell Towers	2
		Information Centers	1
		Public Safety Transmitters	1
	Food/Water/Shelter	Wastewater Facilities	1
	Health and Medical	Ambulance Stations	1
		Medical Facilities	1
	Other/Schools	Schools	1
	Safety and Security	Fire Station	1
	Transportation	Helipads	1
		TOTAL	**10**
GRAND TOTAL			**17**

Sources: Summit County, DOLA, HIFLD.

Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk in more detail where the risk varies from the rest of the planning area. Vulnerability details for the following bulleted hazards are often difficult to compile or estimate for specific jurisdictions and are already described in the Section 3.3.3 of the Base Plan. Figure L-1, Figure L-2, Figure L-3, and Figure L-4 represent all available mappable hazards in the profiled districts within this annex.

- Avalanche
- Dam Inundation
- Drought
- Earthquake

- Erosion/Deposition
- Flood
- Hazardous Materials Release (Transportation)
- Lightning
- Pest Infestation (Forest and Aquatic)
- Severe Winter Weather
- Wildlife-Vehicle Collisions
- Windstorm

Therefore, only the following two hazards will be described in more detail herein: Landslide/Mudflow/Debris Flow/Rockfall, and Wildfire.

Landslide, Mudflow/Debris Flow, Rockfall

There are 2 Critical Facilities at risk of landslides in the Snake River Water District. These are listed below:

- Heath and Medical Facility (Keystone Mountain Clinic)
- Transportation Facility (Keystone Mountain Helipad)

Wildfire

Existing Development

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which breaks up areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine critical facilities at risk to wildfire threat in the Water and Sanitation Districts discussed herein. Table L-3 summarizes the critical facilities located within the water and sanitation district boundaries that are at risk of wildfire. All are found in Medium rank wildfire protection assessment areas.

Table L-3 Critical Facilities at Risk of Medium Threat Wildfire, by District

Special District	FEMA Lifeline	Critical Facility Type	Total
Dillon Valley Metro District	Other/Schools	Schools	1
TOTAL			**1**
East Dillon Water District	Safety and Security	Fire Station	1
	Food/Water/Shelter	Wastewater Facilities	1
TOTAL			**2**
Mesa Cortina Water and Sanitation District	n/a	n/a	0
TOTAL			**0**
Snake River Water District	Safety and Security	Fire Station	1
	Communications	Communications/Cell Towers	1
		Information Centers	1
		Public Safety Transmitters	1
	Food/Water/Shelter	Wastewater Facilities	1
	Health and Medical	Ambulance Stations	1
		Medical Facilities	1
	Other/Schools	Schools	1
TOTAL			**8**
GRAND TOTAL			**11**

Source: Summit County GIS/Assessor Office, DOLA, CO-WRAP, U.S. Census, Wood analysis

Future Development

Residential development continues to occur in the wildland-urban interface (WUI) where limited access, lack of a central water supply with fire hydrants, and longer response times elevate the risk associated with a wildfire event. Development in wildland-urban interface areas is regulated through the building code and land use planning policies of the jurisdiction in which the development is located. Summit County has wildfire mitigation policies as a part of their county code.

Growth and Development Trends

Mesa Cortina has 249 platted lots of which 219 are currently developed.

L.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

Regulatory Mitigation Capabilities

Regulatory mitigation capabilities include the planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities. The water and water & sanitation districts are governed under the policies and programs of Summit County or the Towns (if the district falls within town boundaries), including their building codes and land use planning. Table L-4 through Table L-7 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the districts.

Table L-4 Dillon Valley District—Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	No	
Zoning ordinance	No	
Subdivision ordinance	Yes	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	
Building code	Yes	
Fire department ISO rating	N/A	
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	Yes	

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	No	
Other special plans	Yes	Source Water Protection Plan
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	
Other	No	

Table L-5 East Dillon Water District—Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	No	
Zoning ordinance	No	
Subdivision ordinance	Yes	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	
Building code	Yes	
Fire department ISO rating	N/A	
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	Yes	
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	Yes	
Other special plans	Yes	Source Water Protection Plan
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	
Other	No	

Table L-6 Mesa Cortina Water and Sanitation District—Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	No	
Zoning ordinance	No	
Subdivision ordinance	Yes	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	
Building code	No	
Fire department ISO rating	N/A	
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	Yes	
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	No	
Other special plans	Yes	Source Water Protection Plan
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	
Other	No	

Table L-7 Snake River Water District—Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	No	
Zoning ordinance	No	
Subdivision ordinance	Yes	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	
Building code	Yes	
Fire department ISO rating	N/A	

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	Yes	
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	No	
Other special plans	Yes	Source Water Protection Plan
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	
Other	No	

Administrative/Technical Mitigation Capabilities

Table L-8 through Table L-11 identify the personnel responsible for activities related to mitigation and loss prevention in the districts.

Table L-8 Dillon Valley District—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	No		
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Contracted	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contracted	
Personnel skilled in GIS	Yes	Contracted	
Full time building official	No		
Floodplain manager	No		
Emergency manager	No		
Grant writer	No		
Other personnel	No		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No		
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No		

Personnel Resources	Yes/No	Department/Position	Comments
Other	No		

Table L-9 East Dillon Water District—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	No		
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Contracted	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contracted	
Personnel skilled in GIS	Yes	Contracted	
Full time building official	No		
Floodplain manager	No		
Emergency manager	No		
Grant writer	No		
Other personnel	No		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No		
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No		
Other	No		

Table L-10 Mesa Cortina Water and Sanitation District—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	No		
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Contracted	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contracted	
Personnel skilled in GIS	No		
Full time building official	No		
Floodplain manager	No		

Personnel Resources	Yes/No	Department/Position	Comments
Emergency manager	No		
Grant writer	No		
Other personnel	No		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No		
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No		
Other	No		

Table L-11 Snake River Water District—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	No		
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Contracted	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contracted	
Personnel skilled in GIS	Yes	Contracted	
Full time building official	No		
Floodplain manager	No		
Emergency manager	No		
Grant writer	No		
Other personnel	No		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No		
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No		
Other	No		

Fiscal Mitigation Capabilities

Fiscal mitigation capabilities are financial tools or resources that the water and water & sanitation districts could or already do use to help fund mitigation activities. These include the following:

- Capital improvements project funding
- Taxes for specific purposes

- Fees for water, sewer, and other services
- Impact fees for new development
- General obligation bonds
- Grants

In the past the districts have primarily used district budgets to fund mitigation.

Mitigation Outreach and Partnerships

- Homeowner meetings, website postings, and newsletters regarding wildfire, drought, and evacuation

Past Mitigation Efforts

- Forest fuel reduction, alternate water sources
- Keystone fuels reduction project
- Straight Creek fuel reduction project

Opportunities for Enhancement

Based on the capability assessment, the participating water and water & sanitation districts have several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the districts to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Colorado's DHSEM. Additional training opportunities will help to inform district staff and board members on how best to integrate hazard information and mitigation projects into district policies and ongoing duties of the districts. Continuing to train district staff on mitigation and the hazards that pose a risk to the districts will lead to more informed staff members who can better communicate this information to the public.

L.5 Mitigation Goals and Objectives

The districts discussed in this annex have adopted the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

L.6 Mitigation Actions

The special districts in this annex identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: Water and Water/Sanitation Districts—1

Jurisdiction:	East Dillon Water District, Mesa Cortina Water & Sanitation District, Dillon Valley District, Snake River Water District
Action Title:	Backup power connection
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	Long term power outages have the potential to disrupt water treatment and supply. This project would entail the installation of a connection to temporary backup power for the districts' treatment plants and pumps to maintain water production.
Ideas for Implementation:	A roll-up generator is being considered for purchase outside of this project that could be used as a countywide resource when and where needed.
Responsible Agency:	District
Partners:	Summit County; Hamilton Creek Metropolitan District
Potential Funding:	District and outside grants.
Cost Estimate:	$50,000
Benefits: (Losses Avoided)	Provide domestic water service to residents in the event of a long-term power outage. Reduce losses due to service interruption.
Timeline:	2018-2025
Status:	Added in 2013. In progress. Dillon Valley is in bid stage for 2020 completion; Not completed for EDWD. Not completed for Mesa Cortina.

Mitigation Action: Water and Water/Sanitation Districts—2

Jurisdiction:	East Dillon Water District, Mesa Cortina Water & Sanitation District, Dillon Valley District, Snake River Water District
Action Title:	Trailer mounted generator
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	A roll-up generator would be purchased that could be used as a countywide resource when and where needed.
Ideas for Implementation:	Facilitate a collaborative discussion between utility providers on the capability of this resource. Look for grant funding to fully fund or match fund the project. Create a shared use and cooperative agreement between the parties.
Responsible Agency:	District
Partners:	Summit County; Hamilton Creek Metropolitan District
Potential Funding:	District and outside grants.
Cost Estimate:	$100,000
Benefits: (Losses Avoided)	Provide domestic water service to residents in the event of a long-term power outage. Reduce losses due to service interruption. A mobile generator would reduce installation and maintenance costs associated with permanent generators.
Timeline:	2018-2021
Status:	Added in 2013. In progress. Dillon Valley is making a list of contacts with portable generators in surrounding areas; Not completed for EDWD and Mesa Cortina.

Mitigation Action: Water and Water/Sanitation Districts—3

Jurisdiction:	East Dillon Water District, Mesa Cortina Water & Sanitation District, Dillon Valley District, Snake River Water District
Action Title:	Maintain existing wildfire mitigation efforts and identify access road mitigation needs
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	The districts have done defensible space projects at the facility and service tank locations for each of these areas. This project would continue the mitigation benefits accomplished by these projects through continued maintenance of these sites including removal of ladder fuels, mowing of brush, and FireWise landscaping techniques. This project would also include working with Summit County OEM and GIS to identify district facility access roads that may need additional wildfire mitigation. Overlaying existing wildfire treatments with these roads might identify 'gaps' that may warrant additional mitigation efforts.
Ideas for Implementation:	Ongoing work conducted at a district level. The mapping project would be done in coordination with Summit County OEM and GIS.
Responsible Agency:	Districts
Partners:	Summit County
Potential Funding:	District and outside grants.
Cost Estimate:	$2,500.00 annually
Benefits: (Losses Avoided)	Reduce impacts from wildfire to Critical facilities. Continued access to facilities for fire protection and enhanced first responder safety.
Timeline:	2018-2021
Status:	Added in 2013. In progress. EDWD implements wildfire mitigation actions annually. Not completed for Dillon Valley. Completed and ongoing for Mesa Cortina Water & Sanitation District.

Mitigation Action: Water and Water/Sanitation Districts—4

Jurisdiction:	East Dillon Water District, Mesa Cortina Water & Sanitation District, Dillon Valley District, Snake River Water District
Action Title:	Develop Source Water Protection Plan (SWPP)
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	The program would encourage community-based protection and non-regulatory preventive management strategies to ensure that all Districts' drinking water resources are kept safe from future contamination. SWPP have been completed for Mesa Cortina Water & Sanitation District, Dillon Valley District, Snake River Water District
Ideas for Implementation:	Delineate the source water protection area, inventory potential sources of contamination, develop best management practices and implement protection measures. Work with CO Rural Water Association to complete plan for East Dillon Water District.
Responsible Agency:	District
Partners:	Summit County; CO Rural Water Association
Potential Funding:	CO Department of Public Health and Environment's SWAP Development and Implementation Grant.
Cost Estimate:	$50,000
Benefits: (Losses Avoided)	Provide protection of water resources from hazard impacts.
Timeline:	1-3 years
Status:	Added in 2013. Not completed for EDWD but in progress for Dillon Valley District. Mesa Cortina Completed this in 2012. Carried forward in 2020 for Snake River Water District.

Mitigation Action: Water and Water/Sanitation Districts – 5

Jurisdiction:	Dillon Valley District
Action Title:	Hazardous Materials – Transporation
Hazard(s) Mitigated	Hazardous Materials Incidents
Priority:	High
Issue/Background:	To avert hazardous materials and toxic materials spilled on I-70 during a traffic accident/incident.
Ideas for Implementation:	To research and determine the options on how to best plan to avert a catastrophic hazardous materials spill from an accident/incidents on I-70, which is a major highway and is located close to the District's water treatment facilities and water source. See also related County Action #24 Hazmat Roadway Projects
Responsible Agency:	Dillon Valley Administrator
Partners:	CDOT, Summit County
Potential Funding:	General fund
Cost Estimate:	$1,000
Benefits: (Losses Avoided)	The benefits would be to reduce the possibility of damage to the District's water treatment plant, and water storage tanks that serve the public.
Timeline:	2021
Status:	New in 2020

Mitigation Action: Water and Water/Sanitation Districts—6

Jurisdiction:	East Dillon Water District
Action Title:	Hydrologic Monitoring
Hazard(s) Mitigated	Drought
Priority:	Low
Issue/Background:	Drought is a gradual phenomenon, often occurring slowly, over a multi-year period and is often not obvious to quantify when a drought event begins and ends. Drought impacts are wide-reaching and may be economic, environmental, and/or societal.
Ideas for Implementation:	Install and maintain stream flow gauges to develop historical data for understanding localized drought status.
Responsible Agency:	East Dillon Water District
Partners:	Summit County
Potential Funding:	CWCB, FEMA HMA Grants
Cost Estimate:	$5,000 initial installation, $2,000 annual maintenance
Benefits: (Losses Avoided)	Drought preparation and public awareness
Timeline:	Ongoing
Status:	New in 2020

Mitigation Action: Water and Water/Sanitation Districts—7

Jurisdiction:	Mesa Cortina Water and Sanitation District
Action Title:	Cast iron water main replacement project
Hazard(s) Mitigated	Drought
Priority:	Medium
Issue/Background:	A majority of Mesa Cortina's water mains are cast iron pipe. Cast iron is much more prone to line breaks than ductile iron due to the brittleness of cast iron.
Ideas for Implementation:	A gradual replacement of the cast iron piping will save water and money over the long run. Properly installed ductile iron should have a life expectancy of 50+ years.
Responsible Agency:	Mesa Cortina Water and Sanitation Board of Directors
Partners:	
Potential Funding:	District budget
Cost Estimate:	15,000' of replacement at $120/linear foot = 1.8 million dollars
Benefits: (Losses Avoided)	Reduce the loss of water lost during main breaks Reduce interruption of water service to customers caused by main breaks Helps to maintain a very critical component of a water and sewer system
Timeline:	10-15 years
Status:	New in 2020

L.7 Implementation and Maintenance

Moving forward, the Districts will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the Metropolitan District to help inform updates and the development of District plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

None of the Water and Water and Sanitation District incorporated 2013 risk information into their District's plans or codes, although the HMPC noted being part of the 2013 and reviewing the information from the previous plan did provide a general understanding of each District's risks and vulnerabilities and helped to inform participation in the plan update process.

Process Moving Forward

Moving forward, the water and sanitation districts may use vulnerability information to understand the hazards that pose a risk and the specific vulnerabilities to the jurisdiction in future capital improvement planning for the Districts. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Districts.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from each of the water and sanitation districts will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Monitoring, Evaluation and Updating the Plan

Each of the water and sanitation districts will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The districts will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The District Administrators will be responsible for representing each of the water and sanitation districts in the County HMPC, and for coordination with County staff and departments during plan updates. The water and sanitation districts realize it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

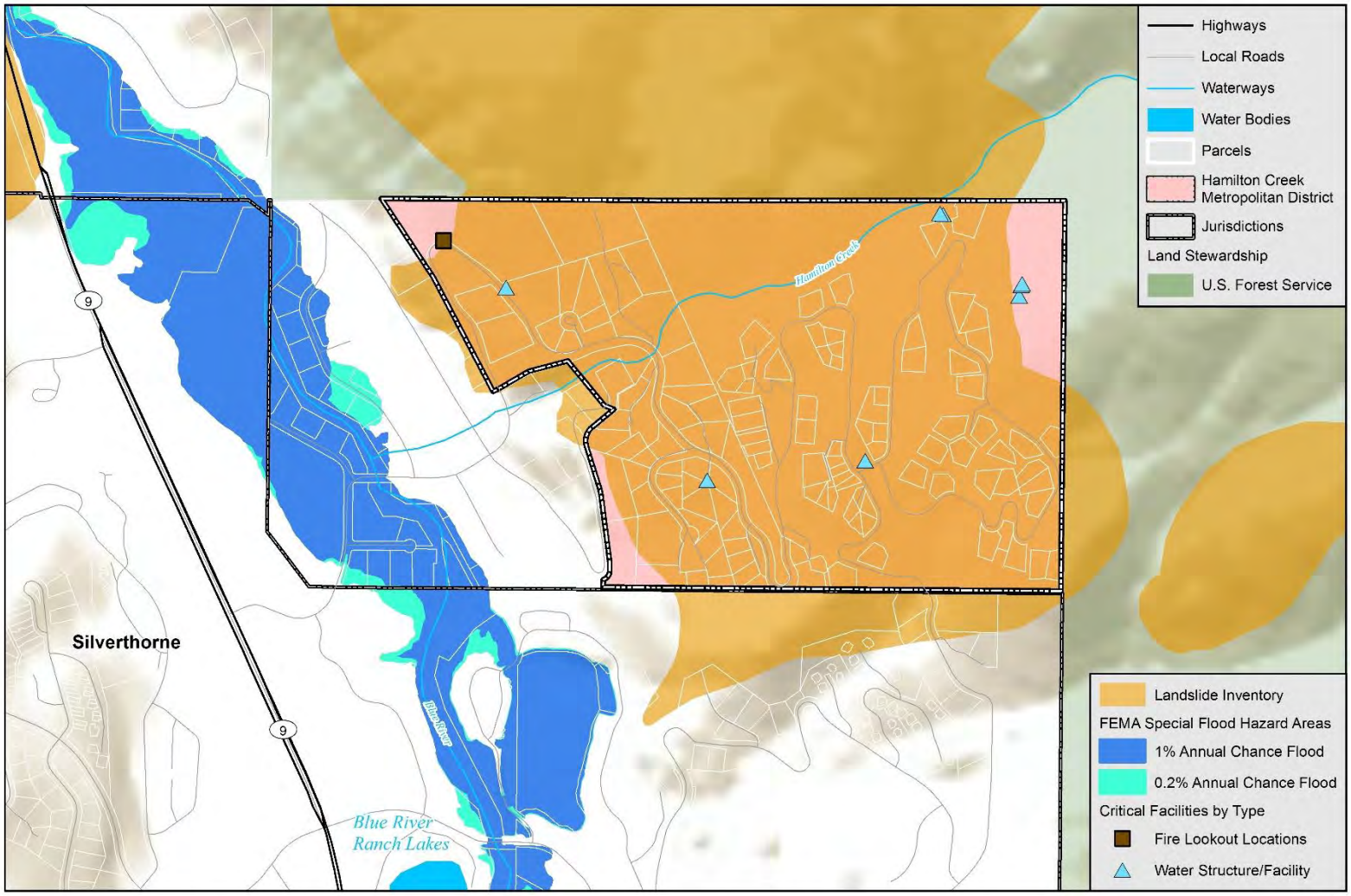
Annex M: HAMILTON CREEK METROPOLITAN DISTRICT

M.1 Community Profile

Hamilton Creek Metropolitan District (HCMD) is a special district in Summit County, located just north of Silverthorne. The District operates under the direction of a five-person, elected Board of Directors. The Board sets policy decisions, which are carried out by HCMD staff. Other staff members include an administrator, auditor, attorney, and water operator.

Figure M-1 shows the location of the Hamilton Creek Metropolitan District as well as all available local hazards. One critical facility is located within the district boundaries.

Figure M-1 Hamilton Creek Metropolitan District and Local Hazards



Map compiled 2/2020;
intended for planning purposes only.
Data Source: US Census TIGER Database,
CO Open Data Portal, CO BLM, Summit County,
ESRI World Terrain Basemap, FEMA NFHL,
CGS, CO DOLA/Demography Office.

M.2 Hazard Identification and Profiles

Representatives of HCMD identified the hazards that affect the District and summarized their geographic location, probability of future occurrence, potential magnitude or severity, and planning significance specific to the Town (see Table M-1). In the context of the countywide planning area, there are no hazards that are unique to HCMD.

Table M-1 HCMD—Hazard Summary

Hazard Type	Geographic Location	Probability of Future Occurrence	Magnitude/ Severity	Overall Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Incidents	Isolated	Unlikely	Negligible	Low
Drought	Large	Likely	Negligible	Medium
Earthquake	Isolated	Occasional	Limited	Low
Erosion/Deposition	Isolated	Unlikely	Negligible	Low
Flood	Isolated	Unlikely	Negligible	Low
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Negligible	Low
Landslide, Mudflow/Debris Flow, Rockfall	Large	Occasional	Limited	Medium
Lightning	Isolated	Highly Likely	Negligible	Low
Pest Infestation (Forest and Aquatic)	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Limited	Low
Wildfire	Large	Occasional	Critical	High
Wildlife-Vehicle Collisions	Small	Likely	Negligible	Low
Windstorm	Large	Likely	Limited	Low

Note: See Section 3.2 of the HIRA document for definitions of these hazard categories.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles in the body of this document.

M.3 Vulnerability Assessment

The intent of this section is to assess Hamilton Creek Metropolitan District's vulnerability separate from that of the planning area (i.e. Summit County) as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment of the main plan. This vulnerability assessment analyzes the population, property, critical facilities, and other assets at risk for the more significant hazards or where available data permits a more in-depth analysis. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment of the Base Plan.

District Asset Inventory

Table M-2 shows the total number of improved parcels, properties, and their improvement and content values for the District. Note that only those parcels with improvement values greater than $0, or those which were classified as "exempt," were accounted here and in vulnerability assessments to follow, so that those non-developed or non-improved parcels were left out for the purposes of conducting the vulnerability assessments in this annex. Counts and values are based on the latest county assessor's data

(as of November 2019), which was provided in GIS format. Contents exposure values were estimated as a percent of the improvement value here and under the hazard vulnerability assessment, specifically: 50% of the improvement value for Residential structures, and 0% for Exempt parcels. These percentage calculations are based on standard FEMA Hazus methodologies. Finally, Total Values were aggregated by adding the improvement and content values for each parcel type category.

Table M-2 HCMD—Property Exposure

Parcel Type	Total Properties	Improved Value	Content Value	Total Value
Exempt	10	$0	--	$0
Residential	105	$86,641,283	$43,320,642	$129,961,925
TOTAL	**115**	**$86,641,283**	**$43,320,642**	**$129,961,925**

Source: Summit County Assessor Data, DOLA, November 2019

Table M-3 lists the critical facility location in the District that is important to protect in the event of a disaster. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 3.3.2 of the Base Plan.

Table M-3 HCMD—Critical Facilities and Other Community Assets

FEMA Lifeline	Critical Facility Type	Total
Safety and Security	Fire Lookout Locations	1
Food/Water/Shelter	Water Structure	7
	Water Treatment Plant	1
TOTAL		**9**

Sources: Summit County, HIFLD, DOLA, Wood Analysis

Vulnerability by Hazard

This vulnerability section analyzes existing and potential future risk to hazards deemed significant for the District or to detail how the hazard varies from the planning area. These hazards include Landslide, and Wildfire. Hazards available for mapping are represented in Figure M-1.

Table M-4 HCMD Properties Vulnerable to 1% and 0.2% Annual Chance Flood Events

Flood Risk	Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Loss Estimate (25% Total Value)	Population
100-year	Residential	13	$6,201,633	$3,100,817	$9,302,450	$2,325,612	40
500-year	Residential	2	$569,582	$284,791	$854,373	$213,593	6
GRAND TOTAL		**15**	**$6,771,215**	**$3,385,608**	**$10,156,823**	**$2,539,206**	**47**

Source: Summit County GIS/Assessor Office, DOLA, FEMA NFHL, U.S. Census, Wood analysis

Landslide, Mud Flow/Debris Flow, Rockfall

There are 113 properties exposed to identified landslide areas in the District, with a potential of 322 people and over $128 million of property values exposed, as summarized in Table M-5. A total of 5 District critical facilities are found in known landslide areas. These include the following:

- PRV Vault on Hamilton and Lakeview
- Dry well on Hamilton Creek Rd
- PRV Vault on Stormwatch Circle
- Well House
- Water Treatment Plant on Lakeview Circle

Table M-5 Property Exposure to General Landslide Hazard Areas in HCMD

Parcel Type	Total Properties	Improved Value	Content Value	Total Value	Population
Exempt	9	$0	--	$0	--
Residential	104	$85,775,341	$42,887,671	$128,663,012	322
TOTAL	**113**	**$85,775,341**	**$42,887,671**	**$128,663,012**	**322**

Source: Summit County GIS/Assessor Office, DOLA, CGS, U.S. Census, Wood analysis

Wildfire

General Property, People, and Critical Facilities/Infrastructure

Wildfire threat was estimated from the County's Wildfire Protection Assessment Rating layer, which breaks up areas into Low, Medium, High, and Extreme ratings. This wildfire layer was used in GIS to determine the number, type, and improvement values for properties found to overlap with them, and hence estimate potential property risk to wildfire threat in the Hamilton Creek Metropolitan District. For the purposes of this analysis, the wildfire zone that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Improvement values were then summed by wildfire rating area and then sorted by parcel type. Property improvements and content values were then totaled to arrive at the Total Value column, which is also the estimated value at risk based on FEMA loss curve standards for wildfire hazards.

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard of the Base Plan, and summarized for the District in Table M-6, all properties at risk of fire hazards are found in Medium or High rated protection assessment zones in the District. There are 4 properties falling in the High threat category with over $5.9 million of property value exposed, most being Residential. A total of 85 properties are located in Medium threat categories, with over $91.8 million in total property values exposed, with most also being Residential properties.

Table M-6 Property Exposure to Wildfire Areas in HCMD

Wildfire Risk	Parcel Type	Total Properties	Improved Value	Content Value	Total Value and Loss Estimate	Population
High	Residential	4	$3,934,715	$1,967,358	$5,902,073	12
	TOTAL	**4**	**$3,934,715**	**$1,967,358**	**$5,902,073**	**12**
Medium	Exempt	8	$0	--	$0	--
	Residential	77	$61,249,724	$30,624,862	$91,874,586	239
	TOTAL	**85**	**$61,249,724**	**$30,624,862**	**$91,874,586**	**239**
GRAND TOTAL		**89**	**$65,184,439**	**$32,592,220**	**$97,776,659**	**251**

Source: Summit County GIS/Assessor's Data, DOLA, CO-WRAP, U.S. Census, Wood analysis

A total of 4 critical facilities identified in Table M-3 (and listed below) are found in areas rated as Medium under the Wildfire Protection Assessment ranking. The other 5 critical facilities to the District are located in Low vulnerability areas.

- Fire Lookout Location on Hamilton Creek Rd, West
- PRV Vault on Stormwatch Circle (water structure)
- Dry Well on Hamilton Creek Rd (water structure)
- PRV Vault on Hamilton and Lakeview (water structure)

Summit Fire EMS Authority (SFE) provides fire protection services to HCMD. SFE is considered an initial attack center for wildland fires on all private land and takes a joint responsibility with the U.S. Forest Service for fires on federal land.

Future Development

Residential development continues to occur in the wildland-urban interface where limited access, lack of a central water supply with fire hydrants, and longer response times elevate the risk associated with a wildfire event. Development in wildland-urban interface areas is regulated through the building code and land use planning policies of the jurisdiction in which the development is located. Summit County and Silverthorne have wildfire mitigation policies as a part of their county or municipal code.

Growth and Development Trends

The HMPC did not note any growth and development concerns with respect to hazards during the 2020 plan update.

M.4Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

Regulatory Mitigation Capabilities

Regulatory mitigation capabilities include the planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities. The District is governed under the policies and

programs of Summit County, including its building codes and land use planning. Table M-7 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in HCMD.

Table M-7 HCMD—Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	No	
Zoning ordinance	No	
Subdivision ordinance	Yes	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	
Building code	No	
Fire department ISO rating	No	
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	Yes	
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	No	
Other special plans	Yes	Source Water Protection Plan
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	
Other	No	

Administrative/Technical Mitigation Capabilities

Table M-8 identifies the personnel responsible for activities related to mitigation and loss prevention in HCMD.

Table M-8 HCMD—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Comments
Planner/engineer with knowledge of land development/land management practices	No	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Contracted
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contracted
Personnel skilled in GIS	Yes	Contracted
Full time building official	No	
Floodplain manager	N/A	
Emergency manager	No	
Grant writer	No	
Other personnel	No	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Contracted
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No	
Other	No	

Fiscal Mitigation Capabilities

Fiscal mitigation capabilities are financial tools or resources that HCMD could or already does use to help fund mitigation activities. The HMPC noted that Capital Reserves can be used to fund District mitigation activities and projects.

Mitigation Outreach and Partnerships

The HCMD uses District meetings and newsletters to send information to the public related to hazards such as wildfire, drought as well as give the public information related to evacuation routes.

Past Mitigation Efforts

Past mitigation efforts have included fuel reduction to mitigate wildfire risk and the use of alternate water sources to help lessen the impacts of drought.

Opportunities for Enhancement

Based on the capability assessment, the HCMD has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for

staff members related to hazards or hazard mitigation grant funding in partnership with the County and Colorado's DHSEM. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the District will lead to more informed staff members who can better communicate this information to the public.

M.5 Mitigation Goals and Objectives

HCMD has adopted the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4 Mitigation Strategy.

M.6 Mitigation Actions

HCMD identified and prioritized the following mitigation actions based on the risk assessment. Background information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Mitigation Action: HCMD—1 Backup Power Connection

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Backup power connection for treatment plant
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	Long term power outages have the potential to disrupt water treatment and supply. This project would entail the installation of a connection to temporary backup power for the treatment plant to maintain water production.
Ideas for Implementation:	A roll-up generator is being considered for purchase outside of this project that could be used as a countywide resource when and where needed.
Responsible Agency:	Hamilton Creek Metropolitan District
Partners:	Town of Silverthorne, Summit County, East Dillon Water District, Mesa Cortina Water & Sanitation District, Dillon Valley District, Snake River Water District
Potential Funding:	District operations and outside grants.
Cost Estimate:	$100,000
Benefits: (Losses Avoided)	Provide water to full time residents in the event of a long-term power outage. Reduce losses due to service interruption.
Timeline:	5 years
Status:	Ongoing. In planning stages and will be included in the Districts Capital Improvement Plan update. Action added in 2013.

Mitigation Action: HCMD—2 Water Supply Interconnect

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Water Supply Interconnect
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	This project would develop an interconnection with the Town of Silverthorne as an alternate water supply in case of extended drought, contamination of the water source, or long-term power outage.
Ideas for Implementation:	The engineering on this action is finished and the project is 'shovel ready.' Funding is needed for construction to implement the action.
Responsible Agency:	Hamilton Creek Metropolitan District
Partners:	Town of Silverthorne, Summit County
Potential Funding:	District operations and outside grants.
Cost Estimate:	$200,000
Benefits: (Losses Avoided)	Provide water to full time residents in the event of a long-term power outage or other water shortage. Reduce losses due to service interruption.
Timeline:	5 years
Status:	Continue – Not Completed. Included in the District's Capital Improvement Plan. District will need to negotiate with the Town of Silverthorne. Action added in 2013.

Mitigation Action: HCMD—3 Wildfire Mitigation Efforts

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Maintain existing wildfire mitigation efforts
Hazard(s) Mitigated	Wildfire
Priority:	High
Issue/Background:	HCMD has done defensible space projects since 2000 in all areas of the 200-acre subdivision. This project would continue the mitigation benefits accomplished by these projects through continued maintenance of these sites including removal of ladder fuels, mowing of brush, and FireWise landscaping techniques.
Ideas for Implementation:	Coordination of ownership cleanup activities and slash pick up.
Responsible Agency:	Hamilton Creek Metropolitan District
Partners:	Town of Silverthorne, Summit County
Potential Funding:	District operations and outside grants.
Cost Estimate:	$12,000 annually
Benefits: (Losses Avoided)	Reduce impacts to the water plant and water intake area from wildfires. Protection of single-family residents in the subdivision.
Timeline:	5 years
Status:	Continue-Not Completed. Action added in 2013.

Mitigation Action: HCMD—4 Public Education and Outreach

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Continue education and outreach about water conservation
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	HCMD has existing conservation programs in place. The District has electronic meters with readings every four hours on all properties. The District water rate structure is escalating to encourage water conservation.
Ideas for Implementation:	This project would continue existing education and outreach. Water conservation is communicated to the ownership annually and additional information can be provided at annual meetings and with quarterly billings.
Responsible Agency:	Hamilton Creek Metropolitan District
Partners:	Town of Silverthorne, Summit County
Potential Funding:	District operations and outside grants.
Cost Estimate:	$2,500 annually
Benefits: (Losses Avoided)	Reducing demands through water conservation can lead to extended water supplies during times of drought or extended power outages.
Timeline:	5 years
Status:	Completed –Continuing. Electronic water meters installed in 2009. District is continuing education and outreach efforts.

Mitigation Action: HCMD—5 Develop Source Water Protection Plan

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Develop Source Water Protection Plan (SWPP)
Hazard(s) Mitigated	Multi-Hazard
Priority:	High
Issue/Background:	The program would encourage community-based protection and non-regulatory preventive management strategies to ensure that all Districts' drinking water resources are kept safe from future contamination.
Ideas for Implementation:	Delineate the source water protection area, inventory potential sources of contamination, develop best management practices and implement protection measures. Work with CO Rural Water Association on the completion of the SWPP.
Responsible Agency:	Hamilton Creek Metropolitan District
Partners:	CO Rural Water Association; Town of Silverthorne, Summit County;
Potential Funding:	CO Department of Public Health and Environment's SWAP Development and Implementation Grant.
Cost Estimate:	$50,000
Benefits: (Losses Avoided)	Provide protection of water resources from hazard impacts.
Timeline:	1-3 years
Status:	Continue-Not Completed. The SWAP Grant has been completed, SWPP is still in process of being developed. Action added in 2013

Mitigation Action: HCMD—6 Hydrologic Monitoring

Jurisdiction:	Hamilton Creek
Action Title:	Hydrologic Monitoring
Hazard(s) Mitigated	Drought
Priority:	Low
Issue/Background:	Drought is a gradual phenomenon, often occurring slowly, over a multi-year period and is often not obvious to quantify when a drought event begins and ends. Drought impacts are wide-reaching and may be economic, environmental, and/or societal.
Ideas for Implementation:	Install and maintain stream flow gauges to develop historical data for understanding localized drought status.
Responsible Agency:	Hamilton Creek Metropolitan District
Partners:	Summit County
Potential Funding:	CWCB, FEMA HMA Grants
Cost Estimate:	$5,000 initial installation, $2,000 annual maintenance
Benefits: (Losses Avoided)	Drought preparation and public awareness
Timeline:	Ongoing
Status:	New in 2020

M.7 Implementation and Maintenance

Moving forward, the District will use the mitigation action worksheets in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Chapter 5 in the Base Plan.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the Metropolitan District to help inform updates and the development of District plans, programs and policies.

Integration of 2013 Plan into Other Planning Mechanisms

Using the risk information from the 2013 plan the District updated its Capital Improvement Plan to include mitigation projects such as backup power supply and interconnectedness into the CIP update.

Process Moving Forward

Moving forward, the Metropolitan District may use vulnerability information to help inform updates and understanding of the hazards that pose a risk and the specific vulnerabilities to the jurisdiction in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Hamilton Creek Metropolitan District area.

As noted in Chapter 5 Plan Maintenance, the HMPC representatives from the Hamilton Creek Metropolitan District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Monitoring, Evaluation and Updating the Plan

The Hamilton Creek Metropolitan District will follow the procedures to monitor, review, and update this plan in accordance with Summit County as outlined in Chapter 5 of the Base Plan. The District will continue to involve the public in mitigation, as described in Section 5.4 of the Base Plan. The District Manager will be responsible for representing the District in the County HMPC, and for coordination with County staff and departments during plan updates. The Hamilton Creek Metropolitan District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements.

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APPENDIX B: PLANNING PROCESS

SUMMIT COUNTY
COLORADO

OFFICE OF EMERGENCY MANAGEMENT
970.423.8912 ph | 970.453.7329 f
www.SummitCountyCO.gov
501 N. Park Ave. | PO Box 210
Breckenridge, CO 80424

September 19, 2019

RE: Summit County Multi-Hazard Mitigation Plan Update

Summit County is beginning the process of updating our multi-hazard mitigation plan approved in 2013. The purpose of this plan is to reduce or eliminate long-term risk to the people and property of Summit County from the effects of natural and certain man-made hazard events. The Disaster Mitigation Act (DMA) of 2000 requires all local governments to assess their risks to natural hazards and identify actions that can be taken in advance to reduce future losses. The DMA 2000 also requires that local mitigation plans be updated every five years and the Summit County plan is due for a revision.

The Summit County Office of Emergency Management has taken the lead in developing this plan update. The County has hired a consultant, Wood Environment and Infrastructure Solutions Inc., to manage the planning project. Wood will facilitate the planning process, collect the necessary data, and perform other technical services, including updating the risk assessment and plan document. However, Summit County Emergency Management and Wood will need your help to successfully complete this project.

The hazard mitigation planning process is heavily dependent on the participation of representatives from local government agencies and departments, the public, and other stakeholder groups. A Hazard Mitigation Planning Committee will be reformed to support this project and will include representatives from the County, its communities, special districts, and other local, state, and federal agencies in or that serve Summit County.

Your organization's participation on the committee is requested due to your jurisdictional need for inclusion in the County Plan, and/or your ability to contribute needed information, technical knowledge, or other valuable experience to the plan update. Please designate a representative to serve on the committee and attend the kickoff meeting, which will discuss the benefits of developing a hazard mitigation plan, the project schedule, and the hazards that affect Summit County such as wildfire, flooding, drought, winter storms, and others.

Summit County Multi-Hazard Mitigation Plan Update Kickoff Meeting
Wednesday, October 3, 2019
10:00 am-12:00 pm
Breckenridge Library, 103 S. Harris St., Breckenridge 80424

Please respond as to whether or not you or your representative will be able to attend the kickoff meeting via email to Brian.Bovaird@summitcountyco.gov. Thank you for your early attention and response to this important project. I look forward to seeing you on October 3.

Sincerely,

Brian Bovaird
Director of Emergency Management
Summit County, Colorado

From: Brian Bovaird <Brian.Bovaird@summitcountyco.gov>
Sent: Tuesday, October 01, 2019 11:04 AM
To: Aaron Byrne; Ali Richards (alisonrichards@fs.fed.us); Bec Bale (bbale@coppercolorado.com); Becky Franco; Bill Jackson (wfjackson@fs.fed.us); Birch Barron (birch.barron@eaglecounty.us); Brian Lorch; Brislawn, Jeff P; Bruce Farrell; Bryan Webinger; Cailee Hamm - Lake County OEM (lakecountyoem@gmail.com); Chris Shelden (cshel@silverthorne.org); Chuck Clause - Snake River WWTP (Other Fax); Dan Hendershott; Dan Schroder (dan.schroder@colostate.edu); Dana Miller; David Askeland (daskeland@coloradomtn.edu); David Paradysz (dparadysz@vailresorts.com); Deborah Polich; dianem@townoffrisco.com; Don Reimer; Doozie Martin (doozie@fdrd.org); Drew Adkins; Ellen Reid (ereid@keystonescienceschool.org); Ethan Greene (ethan.greene@state.co.us); Flenniken, Kelly; Fritz Homann (william.homann@state.co.us); Howard Bailey (HBailey@usbr.gov); Howard Hallman (future1946@yahoo.com); James Donlon; James Phelps (jamesp@townofbreckenridge.com); Jared Rapp (jared.rapp@state.co.us); Jay Nelson; Jeanne Bistranin (jeanne@summitfoundation.org); Jeff Berino; Jeff Goble (jeffg@townoffrisco.com); Jeff Leigh - Mesa Cortina Water and Sewer District; Jeff Zimmerman; Jeffrey Huntley; Jen Schenk (jenschenk@hichcountryconservationcenter.org); jhall@summitfire. org (jhall@summitfire.org); Jim Curnutte; John Blackwell (john.blackwell@denverwater.org); Judi LaPoint - Summit Chamber of Commerce (Judi@summitchamber.org); julie.mccluskie.house@state.co.us; Kathie Atencio (atencio.kathie@epa.gov); Kathleen Krebs (kkrebs@co.clear-creek.co.us); Kevin Houck (kevin.houck@state.co.us); Mark W Thompson (markw.thompson@state.co.us); Mark Watson; Matt Willitts; mayorzuma@gmail.com; 'Michelle Eddy'; Nancy Kerry (nancyk@townoffrisco.com); Patricia Gavelda (patricia.gavelda@state.co.us); Rick Speer; rickh@townofbreckenridge.com; Robert Jacobs; Ryan Hyland; Sarah Vaine; Scott Hill; Scott O'Brien; Scott Reid; Shellie Duplan; Susan Alexander (sjalexander@csu.org); Tamara Drangstveit (TamaraD@summitfirc.org); Tara Gourdin; Tom Daugherty (tdaugherty@silverthorne.org); Tom Gosiorowski; Tom Oberheide; Tony Cammarata (tonyc@a-basin.net); Treste Huse - NOAA Federal; Troy Wineland; Vale, Chuck
Subject: Thursday Meeting and Agenda
Attachments: Summit County HMPC Kickoff Meeting Agenda_100319.pdf

Good afternoon,
This is a friendly reminder that we will be having our Mitigation Plan Update Kickoff Meeting this Thursday from 10am – 12pm at the Breckenridge Library, located at 103 Harris Street. Attached is an agenda and please let me know if you have any questions or concerns.

Respectfully,
Brian

Brian Bovaird M.A., CEM
Director
Summit County Office of Emergency Management
P.O. Box 210 / 501 N. Park Avenue | Breckenridge, CO 80424

970.423.8912 p | 970.485.5339 c | 970.453.7329 f |
brian.bovaird@summitcountyco.gov
REGISTER HERE FOR SUMMIT COUNTY ALERT

Summit County Hazard Mitigation Plan Update Kickoff Meeting Agenda

Date: Thursday, October 3, 2019
10:00 am-12:00 pm MDT

Meeting at: Breckenridge Library
103 Harris St.,
Breckenridge, CO 80424

Project: Summit County Multi-Hazard Mitigation Plan Update

Subject/Purpose

The purpose of the meeting is to initiate the process for updating the County's Hazard Mitigation Plan (HMP), introduce the Disaster Mitigation Act of 2000, and summarize the hazard mitigation planning process. The HMP is intended to identify hazards, assets at risk, and ways to reduce impacts through long-term sustainable mitigation projects.

Attendees: Summit County Hazard Mitigation Planning Committee and Stakeholders

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1. Introductions
2. Mitigation, Mitigation Planning, and the Disaster Mitigation Act Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC)
4. Overview of the 2013 Summit County Multi-Hazard Mitigation Plan
5. Objectives and Schedule for HMP Update
6. Review of Identified Hazards
7. Coordinating with Other Agencies, Related Planning Efforts, and Recent Studies
8. Planning for Public Involvement
9. Initial Information Needs
10. Questions and Answers

wood.

Summit County Hazard Mitigation Planning Team Kickoff Meeting Breckenridge, CO 10/3/2019 10:00am-noon

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles Roundtrip	Total Hours (including Travel)
REBECCA FRANCO	Mngr of EM	Denver Water	rebecca.franco@denverwater.org	3.250.1575	156.6	5 hrs
ANDREW DANDY	Director of EO	Keystone Sci: sch.	adando@keystonesciencesschool.org			
Deborah Polick	Admin	Dillon Valley Dist.	Xprt Admin@comcast.net	970 668 5500	20	3hrs
Matt Willitts	Operations	multiple Agencies	mwillitts@wsidenver.com	970-390-8615	20	
Addison Canino	Asst. Director	Frisco Public Works	addisonc@townoffrisco.com	970.331.6632		.5
Dan Reimer	Planning Director	Summit County	dan.reimer@summitcountyco.gov	970-668-4207	20	2

Meeting Room Cost_____ Meeting Supplies (copies) Etc Cost_____

Summit County Hazard Mitigation Planning Team Kickoff Meeting Breckenridge, CO 10/3/2019 10:00am-noon

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles	Total Hours (including Travel)
Jeff Berino	Fire Chief	SFC	jberino@summitfire.org		20	3
Bruce Farrell	Dep. Chief	SFC	bfarrell@summitfire.co		20	3
Brian Bovaird	Emergency Manager	SCOEM	brian.bovaird@summitco	970-485-5339	N/A	N/A
Michelle Eddy	Town Manager	Blue River	michelle@townofblueriver.org	970-547-0545	3	-
Jay Nelson	Dep. Chief	RWB	jnelson@rwbfire.org	970 453 2474	15	
Tanya Power	Director	TSF	Tanya@summitfoundation.org	9703894979	n/a	2
Bill Gibson	Interim Community Development Director	Town of Frisco	billg@townoffrisco.com	970-668-9121	15	2.5
Tom Oberheide	Administrator	EAST DILLON WATER HAMILTON CREEK METRO	admin@eastdillon.com	970-468-6256		
Eric White	Fuels Specialist	USFS	eric.white@usda.gov	970-262-3459		
Bill Jackson	District Ranger	US Forest Service	william.jackson@usda.gov	970-389-2460	25	2

Meeting Room Cost_____ Meeting Supplies (copies) Etc Cost_____

Summit County Hazard Mitigation Planning Team Kickoff Meeting Breckenridge, CO 10/3/2019 10:00am-noon

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles	Total Hours (including Travel)
J Scott Marr	Asst. Dean	Colorado Mtn. College	jmarr@coloradomtn.edu	9709949519	3	10 min
SCOTT O'BRIEN	PWD	TOWN OF DILLON	scotto@townofdillon.com	(970) 262-3408	30	1 HR
Shellie Duplan	Manager	BMMD	shellie@bmmd.org	970-513-1300	30	3
JEFF LEIGH	MGR	MESA CORTINA	JEFFRLEIGH @GMAIL	970-389-0109	50	3 1/2
John Blackwell	MGR	Denver Water		970-389-6091	10	20mn
Drew Adkins	COO	Summit Schools	drew.adkins@summitk12.org	368-1003		
John Hall	Div chief	Summit Fire & EMS	jhall@summitfire.org	970-668-4330		
Tom Gosiorowski	Public Works Director	Summit County	tom.gosiorowski@summitcountyco.gov	9704712132	105	~~3.5~~ hrs
JEFF ZUMMACH	SR DIR MOUNTAIN OP'S	BRECKENRIDGE SKI RESORT	JEFFZ@VAILRESORTS.COM	9703334804	1	2
David Paradysz	H&S Manager	Keystone Ski Resort	dparadysz@vailresorts.com	530-318-2568	15 miles	30min
JARED RAPP	CAPTAIN	COLORADO STATE PATROL	jared.rapp@state.co.us	970-903-2573	20	1.5
Dan Schroder	CSU Extension Director - Summit	Summit County Community Development	dan.schroder@colostate.edu	970 668 4140	20	.5

Meeting Room Cost_____ Meeting Supplies (copies) Etc Cost_____

Summit County Multi-Jurisdictional Hazard Mitigation Plan 2019 Update

Kick-Off Meeting Summary

10 am - 12 pm
October 3, 2019

Breckenridge Library
103 Harris St., Breckenridge, CO

Introductions and Opening Remarks

This document summarizes the kickoff meeting for the Summit County Hazard Mitigation Plan update for 2019. The meeting was facilitated by Wood Environment & Infrastructure Solutions, Inc. (Wood), the consulting firm hired to facilitate the planning process and develop the updated County plan. Brian Bovaird, Director of Emergency Management for Summit County began the meeting with introductions. Brian first introduced Jeff Brislawn, project manager and Amy Carr, Hazard Mitigation Planner at Wood. Brian then asked those in attendance at the meeting to introduce themselves. Twenty-eight (28) persons representing a mix of county departments and the participating jurisdictions were present and documented on a sign-in sheet. County representatives included the Planning Department, Office of Emergency Management, CSU Extension and Public Works Department. Jeff asked the group how many at the meeting where part of the update process five-years ago; five individuals raised their hands noting they were part of the previous planning process.

Following introductions Jeff discussed the agenda items; the key discussion is summarized below, and additional details are within the meeting PowerPoint presentation.

Hazard Mitigation Overview

Mark Thompson of the Colorado Department of Homeland Security and Emergency Management (DHSEM) was unable to attend in person but supplied Wood with PowerPoint slides to present in his absence. The provided slides outlined what hazard mitigation is and why mitigation it is important. Jeff explained hazard mitigation should be an ongoing effort integrated into both day-to-day operations and long-term planning. Jeff noted that FEMA is only concerned with natural hazards being profiled within these plans but explained this does not preclude communities from including manmade hazards, which could help in having a one stop plan for all types of hazards that pose a risk to the community. Jeff continued by explaining a hazard mitigation plan is not a regulatory document and is not a set-in-stone commitment of resources. The overall purpose of a local hazard mitigation plan is to prevent knowable hazards from having an impact on the community.

Jeff stated there are two main types of benefits a community gains from having a FEMA approved hazard mitigation plan (HMP); (1) bringing people together in the community; (2) having an HMP approved by FEMA makes a community eligible for FEMA grants (Pre-Disaster Mitigation, Flood Mitigation Assistance, Hazard Mitigation Grant Program-Post-Disaster). Jeff noted Summit County's existing plan expires March

8, 2020 and the plan update will need to be approved prior to that date in order for the County to remain eligible for funding. It will also need to be approved in order for the county's application for PDM funding for mitigation work on the Goose Pasture Tarn Dam to be approved.

Jeff continued by noting that any funding requests from FEMA needs to be based on the hazards and mitigation strategy in the HMP. He added that information from the hazard mitigation plan, specifically the vulnerability assessment and mitigation strategy, can be used in other hazard related plans such as community wildfire protection plans.

FEMA will only fund mitigation projects that will reduce future demand for and the costs of disaster response and recovery such as retrofitting a critical facility, enforcing building codes, land use planning, or removing a structure from a hazard area. Mitigation funding cannot be used for response actions such as purchasing of vehicles for fire or police departments. Jeff continued by briefly reviewing the benefit-cost relationship of mitigation projects. He shared statistics from the 2017 National Institute of Building Science Report which showed that mitigation grants funded through select federal government agencies, on average, can save the nation $6 in future disaster costs for every $1 spent on hazard mitigation. Since 2011, Colorado has had 116 projects awarded FEMA funding for mitigation projects. Jeff continued by sharing examples of how mitigation grant funding through FEMA's Hazard Mitigation Assistance Program has been used to complete projects that have mitigated their risks from existing hazards.

Jeff continued his presentation by going over some of the planning requirements for the plan. Specifically highlighting the requirement for a participating jurisdiction to be part of an approved plan. Currently, the following jurisdictions are seeking to participate in the planning process in addition to the County, and also participated in the previous plan.

Municipalities:

- Town of Blue River
- Town of Breckenridge
- Town of Dillon
- Town of Frisco
- Town of Montezuma
- Town of Silverthorne

Districts:

- Buffalo Mountain Metropolitan District
- Copper Mountain Consolidated Metropolitan District
- Denver Water
- Dillon Valley District
- East Dillon Water District
- Hamilton Creek Metropolitan District
- Lake Dillon Fire Protection District
- Mesa Cortina Water and Sanitation District
- Red, White, and Blue Fire Protection District
- Summit Fire and EMS Authority*
- Snake River Water District

*The Summit Fire and EMS Authority, a special district, will be a new participating jurisdiction with this update process.

In order for these jurisdictions to be considered a "participating" jurisdiction they cannot simply adopt the plan but have to also assess their unique risks and identify specific mitigation actions for their community. Jeff finished presenting the slides from DHSEM with asking the HMPC if they have any questions. There was one question; "The State Highway system, the Eisenhower Tunnel specifically, is critical to the community, what is the role of state agencies in the planning process, are they considered participating jurisdictions?" Brian noted that the Colorado Department of Transporation (CDOT) was invited to participate in this planning process but were unable to attend the kick off meeting. Jeff noted that for this planning process CDOT would be considered a stakeholder.

Hazard Mitigation Planning Process and Requirements

Jeff continued the meeting with the specific planning requirements the County will have to meet in order to have a FEMA approved plan. Jeff reviewed the Disaster Mitigation Act (DMA) of 2000 Requirements and explained that the Hinsdale County Multi-Jurisdictional Hazard Mitigation Plan (HMP) will be updated in accordance with these requirements. The planning process involves a 4 Phase approach with 9 tasks per FEMA guidance updated in 2013. The kickoff meeting is the first step in the process and also covers tasks 1-3 (Determine the planning area and resources; Build the planning team; Create an outreach strategy).

Role of the Hazard Mitigation Planning Committee (HMPC)

The first step in getting organized is to determine the hazard mitigation planning committee members, which has already started with those in attendance at the kickoff meeting. Jeff gave those present additional recommendations of who could also be invited to be on the committee, starting with those who were on the committee for the 2014 plan. Jeff first asked the group if there was anyone present that participated in the last plan and a few people raised their hand.

Jeff emphasized that local input, and participation from the county, municipalities, and special districts is required for full approval from FEMA. Participation includes the following:

- Attend meetings and participate in the planning process
- Provide requested information to update or develop jurisdictional information
- Review drafts and provide comments
- Identify mitigation projects specific to jurisdiction, provide status
- Assist with and participate in the public input process
- Track time and mileage
- Coordinate formal adoption

This plan update is being funding through a cost-share funds. As part of the cost-sharing requirements, participating jurisdictions will need to track their time and mileage spent on the planning process.

The Stakeholders include other local, state and federal agencies with a stake in hazard mitigation in the County or may include academic institutions and local business and industry. There were several

stakeholder agencies/entities present. Stakeholders do not need to adopt the plan but can partner on mitigation projects and will have the opportunity to review the plan and provide input into the planning process

State and federal stakeholder may include the U.S. Forest Service, CO State Forest Service, and CO Avalanche Information Center. Neighboring counties will also be notified about the update and given an opportunity to provide input into the process. Stakeholders have various options and levels of participation including:

- Attend HMPC meetings or stay in loop via email list
- Provide data/information
- Partner on mitigation efforts
- Review draft plan

Plan Update Requirements, Key Elements and Schedule

Aspects of the planning process include:

- Engage the participants to take part in planning process and efforts
- Raise awareness and engage the public
- Update hazards and baseline development data to reflect current conditions
- Update the mitigation strategy
- Document progress and note changes in priorities

An important requirement of the hazard mitigation planning process is involving the public in the process. FEMA requires the HMPC provide two opportunities for public involvement. FEMA does not prescribe how to involve the public, but Wood recommends this take place during the drafting stage and once more prior to plan approval. There are several advantages to involving the public including developing solutions that fit local needs better, strengthening local support for the plan and ensuring a fair process in the development of the plan. Jeff acknowledged that it can be challenging to get the public to attend meetings and shared that Wood has had success with using online surveys to receive good feedback. It is also recommended to "piggyback" public meeting with other related meetings.

Another requirement of the plan update process is performing a community capability assessment. This is an assessment of the communities existing plans, regulations, fiscal abilities, administrative and technical abilities. Identifying fiscal abilities early on is important because FEMA requires a 25% match of local funds. Early identification will help to understand potential funding sources now that could be used to possibly match the federal funds.

Conducting a risk assessment is a key aspect of a hazard mitigation plan and involves two components; hazard identification (what can happen here) and the vulnerability assessment (what will be affected). The HMP update will be based on existing documents and studies, with the Summit County Hazard Mitigation Plan (2014) providing the baseline for identified hazards and the groundwork for goals, policies and actions for hazard mitigation. Jeff asked the group if there were any mitigation success stories since the last plan update. The Buffalo Mountain Metropolitan District shared that during the Buffalo Mountain Fire that took place in June 2018, power was cut to a portion of the community and the District was unable to

pump water. As a result of that incident generators have been purchased, although they have not been put to the test yet.

The HMP will be updated over the next four months, with at least two more meetings with the Hazard Mitigation Planning Committee. Wood will be updating the Hazard Identification and Risk Assessment (HIRA) in the next month, with input from the HMPC. Three drafts of the HMP will be created: the first for review by HMPC committee, a second for public review, and a third for state and FEMA review. The first draft for HMPC review is targeted for mid-January 2020, and a public review draft in February will coincide with a review by Colorado DHSEM.

Review of Identified Hazards

Based on hazards from the 2014 County HMP, the list of potential hazards was reviewed. Jeff showed a slide that listed the hazards in the 2014 HMP.

- Avalanche
- Flood
- Severe Winter Weather
- Wildfire
- Drought
- Dam Failure
- Hazardous Materials Release
- Landslide, Mudflow/Debris Flow, Rock Fall
- Lighting
- Mountain Pine Beetle Infestation
- Earthquake
- Erosion/Deposition
- Windstorm

After reviewing the 2014 hazards list and the overall significance ratings, the following discussion took place on the hazards list; Brian noted that in terms of life safety, swift water is a significant hazard for the county in terms of public safety. Jeff noted that swift water will be mentioned within the flood profile during the update. Wood noted that in recent plans Wood has written dam failure has been changed to dam incidents to broaden the profile. Jeff asked the group if wildlife vehicle collisions were a concern in the county, noting it was a hazard that had been profiled in neighboring Grand County's HMP and in the 2018 State Hazard Mitigation Plan. The group answered that there is a lot of ongoing mitigation work related to wildlife crossings. Summit County Safe Passages, a local non-profit is seeking funding to design and implement safe wildlife crossings throughout the county. The committee added the non-profit has been working with other stakeholders including the County, CDOT, USFS and the ski areas. Wildlife vehicle collisions will be added as a new hazard.

Additional discussion related to the "Mountain Pine Beetle Infestation" hazard. That specific type of beetle was noted as no longer being an issue for the County, but the Spruce Beetle was now a concern. Brian suggested looking into how the beetle kill may have increased the county's vulnerability to other hazards such as wildfire or avalanches. Bill Jackson, District Ranger for the U.S. Forest Service in the White River National Forest, suggested "Mountain Pine Beetle Infestation" be changed to "Forest Insect and Disease"

to more encompassing of the variety of insects that could invade the local forests. It was then mentioned that invasive species in the water sources, zebra mussels specifically, is also a concern for the county. Forest beetles were noted as being native to Colorado unlike the zebra mussels, thus it was suggested to change the "Beetle Infestation" hazard to "Pest Infestation (forest and aquatic)".

There were additional questions related to the inclusion of climate change and the interconnectedness of hazards. Jeff recommended that climate change be looked at within each hazard profile and that when the HMPC and Wood revisit the 2014 HIRA to look for how stronger connections could be made. Brian added that isolation in general is a concern for the county especially if there are tunnel closures and should be included the vulnerability assessment for most hazards listed.

Jeff noted that the significance level of hazards will vary by jurisdiction, and some hazards may not be applicable to all jurisdictions. Jeff noted that every hazard profiled must have at least one mitigation action identified.

Jeff Brislawn asked the group to review the list of hazards and comment on how they could be enhanced or updated with:

- Historic incidents
- Incident logs
- Public perception
- Scientific studies
- Other plans and reports (e.g., flood and drainage studies, CWPPs, Internet databases)
- Recent disasters

Coordinating with Other Agencies\Related Planning Efforts\Recent Studies

A discussion on recent studies of hazards in other documents and reports followed the identified hazards discussion. Opportunities for coordinating and cross-referencing the HMP were discussed. Recent studies and related planning efforts included:

- Community Wildfire Protection Plan, 2010, 2018
- Summit County Comprehensive Plan updated in 2018
- Town of Blue River Comprehensive Plan
- CAIC Avalanche Studies
- Summit County Climate Action Plan
- Summit County CWPP
- Capital Improvement Plans

Brian noted that last year the State passed a bill to study the Eisenhower Tunnel and the possibility of allowing hazardous materials trucks through the tunnel. The study has not been conducted yet but should be mentioned the HMP update. Several HMPC members noted that the tourist population and number of visitors to the county not only seasonally but on weekends has been difficult for the HMPC to obtain in the past. Jeff noted this can mentioned as a data gap in the plan and could be made into a mitigation action because of how necessary that data will be in future planning and development.

Initial Information Needs and Next steps

Jeff discussed a slide with initial information needs and next steps. Jeff encouraged the group to send by email information on:

- Recent hazard events (since 2014) – damages, incident logs, damage assessments, etc.
- Growth and development trends
- Recent updated plans and policies

Where available online, Wood will try to obtain the updated plans previously noted. Jeff encouraged the group to send other information that might not be readily accessible online.

A Google Share Drive will be set up for the project to share large documents. A GIS needs list was provided to the County to assist with data collection, which is already in progress. The County will provide the meeting summary, handouts, presentation and sign in sheet by email so that other HMPC members that could not attend today's meeting could get up to speed. Jeff noted that he will be in touch to followup on some of the previously identified data sources and plans.

Wood will begin work in the Hazard Identification and Risk Assessment update and develop a public survey that can be used online, with a hardcopy version for dissemination at local events.

The next HMPC meeting will be on November 14th from 9am-12pm at the County Commons in Frisco, following the update of the Hazard Identification and Risk Assessment section of the plan. The third and final HMPC meeting will be on December 4th from 9am-12pm.

Adjourn

The meeting adjourned at 12:00 pm.

Jeff.brislawn@woodplc.com
303-704-5506
2000 S. Colorado Blvd. Suite 2-1000
Denver, CO 80222

Summit County Hazard Mitigation Plan Update
Risk Assessment and Goals Meeting Agenda

Date: Thursday, November 14, 2019
9:00 am-12:00 pm MDT

Meeting at: County Commons
Buffalo Mountain Room
37 Peak One Dr.
Frisco, CO 80443

Project: Summit County Multi-Hazard Mitigation Plan Update

Subject/Purpose

The purpose of the meeting is to review the results of the Hazard Identification and Risk Assessment and receive input from the committee and stakeholders on the results. Based on the results the committee will begin thinking of new mitigation actions and discuss updates to the plan goals. The hazard mitigation planning process and planning requirements will also be reviewed. The HMP is intended to identify hazards, assets at risk, and ways to reduce impacts through long-term sustainable mitigation projects.

Attendees: Summit County Hazard Mitigation Planning Committee and Stakeholders

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1. Introductions
2. Review of the Planning Process
3. Review of Identified Hazards
4. Vulnerability Assessment Overview by Hazard
5. Capabilities Assessment Update
6. Updating Goals for the Mitigation Plan
7. Mitigation Action Strategy update needs/ideas
8. Update on Public Involvement Activities/public meeting planning
9. Next Steps
10. Questions and Answers

wood.

Summit County Hazard Mitigation Planning Team Workshop #2 Frisco, CO 11/14/2019 9:00am-12:00pm

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles	Total Hours (including Travel)
Rebecca Franco	EM Manager	Denver Water	rebecca.franco@denverwater.org	3.250.1575		
Jay Nelson	Deputy Chief	RWBFD	jnelson@rwbfire.org	970 453 2474	9	~~.3~~ 0.5
Michelle Eddy	Town Manager	Blue River	Michelle@townofblueriver.org	970-547 0545	9	.5
John Hall	Div Chief	SFE	jhall@summitfire.org	970-668-4330	1	
Jim Donlon	Resident	Lower Blue	JamesDonlon@mac.com	970 513 0870	17	
Deborah Polich	Admin	Dillon Valley Dist	XprtAdmin@comcast.net	970 668 5500	10	.5
Jeff Leight	Manager	Mesa Cortina WSD	JeffrLeigh@gmail.		40	4
Addison Canino	Asst. Director	Town of Frisco	AddisonC@townoffrisco.com	970.331.6632	1	
Justin Conrad	Assistant FMO	White River NF	Justin.Conrad@usda.	9705962549	120	2
Bec Bale	Risk/Safety Mngr	Copper Mtn	bbale@coppercolorado.com	9709683012	15	.5
Bill Jackson	District Ranger	US Forest Service	william.jackson@usda.gov	970 389 2460	10	.5
David Paradysz	H&S Manager	Keystone Resort	dparadysz@vailresorts.com	530-318-2568	25	.5
Kelly Flenniken	Area Manager	Xcel Energy	kelly.flenniken@xcelenergy.com	970/778-1118	40	.75
Jeff Zimmerman	Dir Mtn Ops	Breckenridge Resort	↳ JeffZ@vailresorts.com			
Brian Bovard	Emergency Mgr.	Sun Co		9703311804	10	.5
Dan Hendershott	EM Manager	Summit Co	dan.hendershott@summitcountyco.gov	970 485-1116	0	2

Meeting Room Cost_____ Meeting Supplies (copies) Etc Cost_____

Summit County Hazard Mitigation Planning Team Workshop #2 Frisco, CO 11/14/2019 9:00am-12:00pm

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles	Total Hours (including Travel)
Don Reimer	Planning Director	Summit County	don.reimer@summitcounty.co.gov	9706684207	0	1.5
Dan Schroder	CSU Ext Dir.	Summit Cnty	dan.schroder "	970 668 4140	0	3
Gene Fabrusa	Safety Sec	Sum.	gene.fabrusa@...	970 2160907	0	
Sarah Vaine	ACM	Summit County	sarah.vaine@summitcountyco.gov	970-333-1782		1

Meeting Room Cost_______________ Meeting Supplies (copies) Etc Cost_________________

Summit County Hazard Mitigation Planning Team Workshop #2 Frisco, CO 11/14/2019 9:00am-12:00pm

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles	Total Hours (including Travel)
ANDREW DANDY	Director Keystone science school		adandy@keystonescienceschool.org	909-747-7390		
LOGAN MACLEAN	SAFETY MANAGER	KEYSTONE SCIENCE SCHOOL	LMACLEAN@KEYSTONESCIENCESCHOOL.ORG 307 212 0584			
Tyler Johnson	Denver Water Dillon Ops Sup.	Operations supervisor	tyler.johnson@denverwater.org	720.243.9007		
TOM OBERHEIDE	ADMINISTRATOR	HAM. CREEK METRO EAST DILLON WATER	admin@eastdillon.com	970-468-6256	16	

Meeting Room Cost_____ Meeting Supplies (copies) Etc Cost_____

Summit COUNTY HAZARD MITIGATION PLAN
2020 UPDATE
Updating the Mitigation Strategy

Mitigation Planning Goals, Objectives, and Actions - Definitions

Goals, objectives, and mitigation actions should be based on the information revealed in the Risk Assessment. Definitions are provided below:

Goals are general guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that the goals are not dependent on the means of achievement. They are usually broad policy-type statements, long term, and represent global visions, such as:

- Reduce exposure to hazard related losses
- Minimize the risk from natural disasters to existing facilities and proposed development.
- Reduce the impact of natural hazards to the citizens of the county.
- Provide protection for natural resources from hazard impacts
- Maintain and enhance existing mitigation measures.
- Increase public awareness of vulnerability to hazards and support and demand for hazard mitigation

Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable, such as:

- Maintain the flood mitigation programs to provide 100-year flood protection
- Protect critical facilities to the 500 year flood
- Educate citizens about wildfire defensible space actions.
- Prepare plans and identify resources to facilitate reestablishing operations after a disaster.

Mitigation Actions are specific actions that help you achieve your goals and objectives. Some examples include:

- Elevate three historic structures located in the downtown district
- Sponsor a community fair to promote wildfire defensible space
- Retrofit the police department to withstand flood damage

The goals and objectives from the Summit County Hazard Mitigation Plan 2013 are shown on the next page. The 2020 plan update presents an opportunity to review the goals and modify if desired. Use this handout to verify that they are still appropriate or suggest modifications to the planning committee and Wood (Jeff.brislawn@woodplc.com).

Summit County Hazard Mitigation Plan 2013 Goals

Goal 1: Reduce risk to the people, property, and environment of Summit County from the impacts of natural hazards

- Minimize the vulnerability of existing and new development to hazards
- Increase education and awareness of hazards and risk reduction measures
- Improve comprehensive wildfire planning, funding and mitigation
- Strengthen floodplain management programs

Goal 2: Protect critical facilities and infrastructure

- Enhance assessment of multi-hazard risk to critical facilities and infrastructure
- Prioritize mitigation projects based on the enhanced assessment and identify funding sources
- Reduce hazard related closures of transportation routes

Goal 3: Minimize economic losses

- Strengthen disaster resistance and resiliency of businesses and employers
- Promote and conduct continuity of operations and continuity of governance planning
- Reduce financial exposure of county and municipal governments and special districts

Goal 4: Implement the mitigation actions identified in the plan

- Improve communication and coordination between communities and state and federal agencies
- Engage collaborative partners, including community organizations, businesses, and others
- Integrate mitigation activities into existing and new community plans and policies
- Monitor, evaluate, and update the mitigation plan

Other Related Plan Goals

It is also important to integrate the mitigation strategy with other existing goals to ensure consistency, efficiency, and effectiveness, which is also useful in identifying funding opportunities. The following are provided for reference purposes.

Summit County Comprehensive Plan (2009)

Land use Element

Vision: Guide future land use decisions to ensure that growth occurs in appropriate locations and that out rural mountain character is maintained.

Transferable Development Rights (TDRs)

Goal E: Encourage the use of TDRs as a means of protecting sensitive lands, directing growth to areas appropriate for accommodating growth or to mitigate other issues that may arise in development review applications.

Environmental Element

Vision: Protect, enhance, and promote our environmental resources.

Environmentally Sensitive Areas

Goal A: Protect and preserve environmentally sensitive areas.

Policy/Action 1 - Environmentally sensitive areas should be identified, mapped, and protected to the greatest extent possible.

Policy/Action 2 - Consider the location of environmentally sensitive areas when developing basin master plan land use designations and zoning classifications. Focus low intensity land uses and open space designations in location with environmentally sensitive areas.

Policy/Action 3 - Development in environmentally sensitive areas should be avoided to the maximum extent possible. Minimize and mitigate impacts where site conditions preclude the ability to avoid all environmentally sensitive areas.

3.1. While respecting underlying zoning and density and according to established County design standards and regulations, require that new development employ design and construction techniques that, to the maximum extent practicable, utilize sensitive site design of lots and building envelopes to minimize disturbances to environmentally sensitive areas and provide infrastructure most efficiently.

Policy/Action 6 - The County should work cooperatively with homeowner groups and the State and Federal Forest Service to promote healthy and naturally diverse forests while reducing wildfire hazards

Community and Public Facilities Element

Vision: Provide, consistent, reliable, and appropriate facilities for the long-term development of the County that are compatible with the mountain environment.

Water & Sewer

Goal A: Ensure infrastructure is planned, funded, and built to support new development

Policy/Action 8 - Develop incentives or ordinances to mitigate impacts on water resource infrastructure. These may include: receiving credit for water conservation, rain sensor, sub-metering, soil preparation, turf limitation, waste of water, median sub-surface irrigation, or restrictive covenants ordinances.

Design and Visual Resources Element

Vision: Design development to complement the environment, existing neighborhoods, and the historic nature of the County.

Goal B: Ensure that new development is designed in a visually sensitive manner, complementing the surrounding natural environment.

Policy/Action 4 - Require the preservation of significant trees, where feasible, while allowing for forest management practices necessary for forest health and wildfire prevention.

Policy/Action 7 - Require building envelopes and/or disturbance envelopes to be established when necessary in new subdivisions to minimize visual and environmental impacts.

Goal E: Avoid or minimize development impacts on steep hillsides and ridgelines.

Summit County Climate Action Plan (2018)

Forests Sector
Vision: Our communities will value healthy forests and understand their beneficial climate and environmental impacts.

Sector Goal: Maintain forest cover in Summit County and improve forest resilience to climate impacts.

STATE OF COLORADO 2018 MITIGATION GOALS

Minimize the loss of life and personal injuries from all-hazard events (I)
A, D, F, G, H
Reduce losses and damages to state, tribal, and local governments, as well as special districts and private assets, and support similar local efforts (II)
J, O
Reduce federal, state, tribal, local, and private costs of disaster response and recovery (III)
D, E, J, P, Q
Support mitigation initiatives and policies that promote disaster resiliency, nature-based solutions, cultural resources and historic preservation, and climate adaptation strategies (IV)
A, B, E, M, N
Minimize interruption of essential services and activities (V)
D, E, J, L, P, Q
Incorporate equity considerations into all mitigation strategies (VI)
A, E
Support improved coordination of risk mitigation between and among the public, private, and non-profit sectors (VII)
A, C, D, E, G, I, K, L, M, N, O, R
Create awareness and demand for mitigation as a standard of practice (VIII)
A, B, C, E, G, K, L, M, N, O

Mitigation Objectives:

A. Support and empower local and regional mitigation strategies through statewide guiding principles, programs, and resources

B. Promote activities that are climate neutral and supportive of appropriate renewable and alternative energy

C. Strengthen hazard risk communication tools and procedures

D. Strengthen continuity of operations at the federal, state, regional, tribal, and local levels of government to ensure the delivery of essential services

E. Strengthen cross-sector connections across the state government

F. Identify specific areas at risk to natural hazards and zones of vulnerability

G. Expand public awareness, education, and information programs relating to hazards and mitigation methods and techniques

H. Develop mitigation projects focused on preventing loss of life, injuries, and negative impacts to natural resources and reliant community sectors from natural, technological, and human-caused hazards

I. Assist local government officials with construction, non-construction, and regulatory hazard mitigation activities

J. Protect state critical, essential, and necessary assets located in natural hazard risk areas

K. Improve state, tribal, and local government mitigation project monitoring and decision-making tools

L. Strengthen connections between hazard mitigation activities and preparedness, response, and recovery activities

M. Improve coordination of state government mitigation resources with federal, tribal, and local government and private nonprofit resources

N. Increase state, tribal, and local government and private nonprofit participation in existing hazard mitigation programs

O. Partner with local and tribal governments to develop projects, initiatives, and public resources that protect private property from hazards

P. Reduce services interruptions and revenue losses, resulting from hazard events, to the state

Q. Reduce downtime and revenue losses, resulting from hazard events, for local and tribal governments and private nonprofit organizations

R. Through training, grants, and technical assistance, increase local government use of land use strategies that reduce risks to hazards

Summary of the Summit County
Multi-Hazard Mitigation Plan Update
Risk Assessment and Goals Meeting

November 11, 2019
9:00 - noon
County Commons – Buffalo Mountain Meeting Room
37 Peak One Dr. Frisco, CO

Introductions and Opening Remarks

Jeff Brislawn of Wood, the consulting firm hired to facilitate the plan development process, began the meeting with welcoming remarks. Twenty-four persons were present and documented on a sign in sheet.

Review of Mitigation, Disaster Mitigation Act (DMA) Requirements, and the Planning Process

Following introductions a PowerPoint presentation was presented by Jeff Brislawn. Jeff reviewed the planning process being followed and discussed the project status.

Risk Assessment Presentation and Discussion

Jeff outlined the general risk assessment requirements before beginning a detailed discussion of each hazard. He presented highlights on each hazard included in the updated risk assessment chapter of the plan. Refer to the Summit County HMP Risk Assessment PowerPoint presentation for specific details on each hazard and a handout summarizing hazard significance.

Additional insight and details were learned during the risk assessment conversation among participants. Highlights of the discussion are noted by hazard in the table below.

Hazard or Topic	Meeting Discussion and Problem Statements
Avalanche	• Last season events were significant and less isolated than events in the past • Changes were made in avalanche mitigation last season • Flooding due to avalanche debris was a major concern, particularly in Ten Mile but ended up being a nonevent • Xcel experienced damage to both electrical and natural gas lines, poles and regulators o Challenging to reach equipment due to the amount of debris (Ten Mile, Copper near gas station) o Unable to inspect equipment until they received clearance from CAIC – led to people snowshoeing multiple miles to reach equipment o Xcel buried lines to prevent future incidents • USFS suffered tower damage o Highway 91 near Copper noted as problem area • The HMPC noted there are competing priorities for debris removal
Dam Failure Incidents	• Tried to get funding for Black Creek dam repairs – wasn't awarded it because it's a low hazard dam

Hazard or Topic	Meeting Discussion and Problem Statements
	• Ongoing work on the Goose Pasture Dam will be captured as a potential project in the updated mitigation action plan
Drought	• During 2002-2004 drought Dillon Reservoir was very low and produced lots of dust leading to direct impacts to individuals living close by • Frisco side of Dillion Reservoir saw individuals walking through sludge and mud with kayaks due to low water levels • Economic impacts due to low levels of the reservoir because of the drought were noted
Flood	• Ice jam issues near Blue Lake Dam (Upper Blue) – flooded 2 houses along highway o County has worked with Colorado Springs Utility to divert water; sandbagging and pumps • Recent losses on Montezuma Road due to undersized culverts o Road was closed to Town of Montezuma o Culverts have been replaced with bridge • Culverts in Summit Cove were removed and replaced with a bridge to be able to handle 100-year flood • Dillon Valley District has done work to replace culverts • Wood will follow up with County on possible culvert assessments
Erosion/Deposition	• Dillon Valley District noted having issues with channel migration • Dillon Reservoir - sand from erosion and wind on the sides of the dam potentially hiding issues – Federal inspectors have said this is an issue making it hard to inspect • Traction sand from CDOT continues to be an issue
Earthquake	• no comments
Landslide, Debris Flow, Rockfall	• Shale falling along Highway 9, in the north part of the county near the reservoir, has blocked the highway in the past
Wildfire	• A fire in neighboring Grand County resulted in smoke issues for Summit County in the past o 2018 California fires also brought smoke into county • Fire bans common tool o HMPC noted having issues with camp fires not put out completely • County Public Health noted receiving calls from tourists asking if they should cancel their trips because of smoke
Hazardous Materials	• HazMat trucks do go through the tunnel in controlled events when Loveland Pass is closed o Supply chain would be impacted greatly if the tunnel was to close for an extended period of time • Abandoned mines – seepage and blowouts are a concern for the HMPC o Past high-profile events have caused anxiety for citizens o Pennsylvania Mine has been seeping into Snake River • Seepage from mines pose a risk water quality o Impacts to the Dillon Reservoir is a concern • Regional EPA have worked with Towns to conducted mitigation
Lighting	• HMPC suggested changing frequency rating to ‘highly likely’
Winter Storm	• CDOT has been proactively closing I-70 to Vail o HMPC noted it has helped reducing people being stuck in Summit

Hazard or Topic	Meeting Discussion and Problem Statements
	• Tunnel has closed in the past due to severe winter storms impacts on visitors being stuck in Summit and preventing goods into the county • New state traction laws on I-70 • HMPC noted that freezing temperatures have been an issue in the past o Last winter lead to power outages and water line breaks o Concerns related to AFN population
Windstorm	• no comments
Pest Infestation (Forest and Aquatic)	• Marinas have been actively monitoring and conducting mitigation on Aquatic Nuisance Species (ANS) • Dillon Reservoir noted kayakers are also a concern in addition to larger boats • Green Mountain is a 'suspect' reservoir in terms of infestation o USFS has partnerships to inspect or restrict boat access for more control and monitoring
Wildlife-Vehicle Collisions	• no comments
Capabilities	• Ongoing partnerships throughout the County • Inspectors on Dillon Reservoir receive aquatic nuisance species training • County's Transfer of Development Rights Program in partnership with Breckenridge has been considered a success • Extension office tracks progress on wildfire mitigation projects (available online through County website) • **Opportunities for enhancement were discussed including:** o Integrating the hazard mitigation plan or adopting the plan by reference in the next Comprehensive Plan update

Plan Goals Update

The HMPC reviewed the goals and objectives from the previous plan to see if they were still relevant or needed updating, based on a handout that included the state mitigation plan goals and other related plan goals from the County's 2009 Comprehensive Plan. In general, the group thought was they were still valid, but suggested the removal of the word 'natural' from the Goal 1 and to expand the goals to also include visitors and not just residents. Jeff will revise per the suggestions and the group will revisit the goals for finalization at the beginning of the next meeting.

Mitigation Action Strategy update needs

Jeff noted that the mitigation action strategy will be revisited moving forward and will be the focus of the next HMPC meeting. Jeff said that the existing mitigation actions from the 2013 plan will need to be reviewed by the HMPC with a status indicated for each action. Jeff provided a worksheet for each participating jurisdiction to help facilitate the status reporting prior to the next meeting, which will also be shared by email. Status of actions was requested by December 2nd.

There will be an opportunity to develop new mitigation actions for the plan as well. These will be identified at the next meeting. Some initial ideas discussed included:

- Expanding the Transfer of Development Rights program to other jurisdictions through an Intergovernmental Agreement (IGA) similar to the one with Breckenridge.

Update on Public Involvement Activities/public meeting.

Jeff noted that a draft on-line public survey was ready to be distributed. A public meeting will be scheduled in January with details forthcoming.

Plan Timeline/Next steps

The next and final HMPC planning meeting will be during early December (now scheduled for December 4th at 9am). The purpose of this meeting is to develop mitigation actions for the plan. The meeting materials will also be shared electronically, including the presentation and handouts.

The meeting adjourned at 11:35 am.

Summit County Hazard Mitigation Plan Update
Mitigation Strategy Meeting Agenda

Date: Wednesday, December 4, 2019
9:00 am-12:00 pm MST

Meeting at: County Commons
Buffalo Mountain Room
37 Peak One Dr.
Frisco, CO 80443

Project: Summit County Multi-Hazard Mitigation Plan Update

Subject/Purpose

The purpose of this meeting is to review the planning process so far, then modify, add, and/or delete mitigation actions and projects applicable to Summit County based on HMPC input and pertinent plan goals. Prioritization of mitigation projects will be conducted as well, and next steps to plan finalization, including future plan implementation and maintenance, will be discussed.

Attendees: Summit County Hazard Mitigation Planning Committee and Stakeholders

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1. Introductions
2. Review of the Planning Process
3. Review of possible mitigation activities and alternatives
4. Discuss criteria for mitigation action selection and prioritization
5. Review of progress on existing actions in the plan
6. Brainstorming Session: Development of new mitigation actions (group process)
7. Prioritize mitigation actions (group process)
8. Discuss plan implementation and maintenance
9. Discuss next steps
10. Questions and Answers/Adjourn

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Summit County Hazard Mitigation Planning Team – Mitigation Strategy Meeting #3 Frisco, CO 12/4/2019 9:00am-12:00pm

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles	Total Hours (including Travel)
Tyler Johnson	Ops Supervisor	Denver Water	tyler.johnson@denverwater.org	720.243.9007	5	
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SCOTT O'BRIEN	PWD	TOWN of DILLON	scotto@townofdillon.com	970 262 3488	6	3.5
Mark Heninghaus	Chief, Dillon PD	Town of Dillon	markh@townofdillon.com	970 468-6078	6	3.5
Deborah Polich	Administrator	Dillon Valley Dist.	Xprtadmin@comcast.net	970 390 1306	6	3.5
LOGAN MACLEAN	SAFETY MANAGER	KEYSTONE SCIENCE SCHOOL	LMACLEAN@KEYSTONESCIENCESCHOOL.ORG	317 212 0864	12	
Bill Gibson	Interim Community Development Director	Town of Frisco	billg@townoffrisco.com	970-668-9121	2	3
Scott Reid	Director of Recreation	Town of Breckenridge	ScottR@townofbreckenridge.com	970-547-7982	9	3.5
Shellie Duplan	Manager	BMMD	Shellie@bmmd.org	970-513-1300	7	3.5
FRITZ HOMANN	CDOT-OPS MGR.	I-70 MTN. CORR.	WILLIAM.HOMANN@STATE.CO.US	303-514-2504		~~3.5~~
Bec Bale	Copper Mtn Resort Hill Safety Mngr.		bbale@coppercolorado.com	970-291-1290	12	3.5
BRIAN BOYARD	Emergency Mgr.	Sum Co	brian.boyard@summitcountygov	970-485-5339	N/A	N/A
Sarah Vaine	ACM	Sum County	sarah.vaine@summitcountygov.gov	970-333-1782	N/A	N/A

Meeting Room Cost_____ Meeting Supplies (copies) Etc Cost_____

Summit County Hazard Mitigation Planning Team – Mitigation Strategy Meeting #3 Frisco, CO 12/4/2019 9:00am-12:00pm

NAME	POSITION or Title	Jurisdiction/Agency/ Department	EMAIL	PHONE	Total Miles	Total Hours (including Travel)
Jay Nelson	Deputy Chief	RWBFPD	jnelson@rwbfire.org	970 406 0212	18	3.5
Michelle Eddy	Town Manager	Blue River	michelle@townofblueriver.org	970-406-2130	18	3.5
DAVID PARADYSZ	H&S Mgr - Keystone	Keystone Resort	dparadysz@vailresorts.com	530-318-2568	25	3/4
Dan Hendershott	EH Manager	SC Public Hlth	dan.hendershott@summ...	970 485-1116	0	3
ROBERT JACOBS	COUNTY ENGINEER/ ROAD & BRIDGE DIRECTOR	SUMMIT COUNTY	robert.jacobs@summitcounty...	970 668 4212	0	3
Bruce Farrell	Deputy Chief	Summit Fire	bfarrell@summitfire.org	970 418 8156	0	3
John Hall	Div Chief	Summit Fire	jhall@summitfire.org	970-668-4330	0	3
Bryan Webinger	D. St MGR.	CMCMD	bwebinger@cmcmd.com	970 968 2537	8	3
Jim Curnutte	Summit County Com Dev Director	Summit County	JimCurnutte@summitcountyco.gov	970 668-4203	0	0
Addison Canino	Frisco Public Works Asst. Director		addisonc@townoffrisco.com	970.331.6632	1	2
Logan Sand	Community Planner	FEMA Region VIII	logan.sand@fema.dhs.gov	303-202-8966	-	-
Taryn Power	Development Director	Summit Foundation	Taryn@summitfoundation.org	970 389 4979	17	3
Mark Thompson	Mit Plng Specialist	DHSEM	mark.thompson@state.co.us	720 630 0770	-	-
Dan Schroder	Summit County CSU Extension	X	dan.schroder@colostate.edu	970 668 4140	-	3

Meeting Room Cost_____ Meeting Supplies (copies) Etc Cost_____

Example Mitigation Action Items

Alternative Mitigation Actions	Dam Failure	Floods	Hazardous Materials	Avalanche Landslides/ Debris Flows/ Rockfalls	Weather Extremes (hail, lightning, wind, temps, drought)	Earthquakes	Wildland Fires	Severe Winter Storm
PREVENTION								
Building codes and enforcement		■	■	■	■	■	■	■
Comprehensive Watershed Tax		■						
Density controls	■	■	■	■			■	
Design review standards		■	■	■		■	■	
Easements		■	■	■			■	
Environmental review standards		■	■	■		■	■	
Floodplain development regulations	■	■	■					
Hazard mapping	■	■	■	■			■	
Floodplain zoning	■	■	■					
Forest fire fuel reduction			■				■	
Housing/landlord codes			■		■			
Slide-prone area/grading/hillside development regulations				■			■	
Manufactured home guidelines/regulations		■			■	■		
Minimize hazardous materials waste generation			■					
Multi-Jurisdiction Cooperation within watershed	■	■						
Open space preservation	■	■		■			■	
Performance standards	■	■		■	■	■	■	■
Periodically contain/remove wastes for disposal			■					
Pesticide/herbicide management regulations			■					
Special use permits	■	■	■	■			■	
Stormwater management regulations		■	■					
Subdivision and development regulations	■	■	■	■		■	■	
Surge protectors and lightning protection					■			
Tree Management					■		■	■

Alternative Mitigation Actions	Dam Failure	Floods	Hazardous Materials	Avalanche Landslides/ Debris Flows/ Rockfalls	Weather Extremes (hail, lightning, wind, temps, drought)	Earthquakes	Wildland Fires	Severe Winter Storm
Transfer of development rights		■		■			■	
Utility location			■	■	■			■
PROPERTY PROTECTION								
Acquisition of hazard prone structures	■	■		■			■	
Facility inspections/reporting	■	■	■			■		
Construction of barriers around structures	■	■	■					
Elevation of structures	■	■						
Relocation out of hazard areas	■	■	■	■			■	
Structural retrofits (e.g., reinforcement, floodproofing, bracing, etc.)		■	■		■	■	■	■
PUBLIC EDUCATION AND AWARENESS						■		
Debris Control		■		■				
Flood Insurance	■	■						
Hazard information centers	■	■	■	■	■	■	■	■
Public education and outreach programs	■	■	■	■	■	■	■	■
Real estate disclosure	■	■	■	■	■	■	■	■
Crop Insurance					■	■		
Lightning detectors in public areas					■			
NATURAL RESOURCE PROTECTION								
Best Management Practices (BMPs)		■	■	■	■		■	
Forest and vegetation management	■	■		■	■		■	■
Hydrological Monitoring	■	■	■	■	■			
Sediment and erosion control regulations	■	■	■	■				
Stream corridor restoration		■		■				
Stream dumping regulations		■	■					
Urban forestry and landscape management		■		■	■		■	■
Wetlands development regulations		■	■	■			■	
EMERGENCY SERVICES								

Alternative Mitigation Actions	Dam Failure	Floods	Hazardous Materials	Avalanche Landslides/ Debris Flows/ Rockfalls	Weather Extremes (hail, lightning, wind, temps, drought)	Earthquakes	Wildland Fires	Severe Winter Storm
Critical facilities protection	■	■	■	■	■	■	■	■
Emergency response services	■	■	■	■	■	■	■	■
Facility employee safety training programs	■	■	■	■	■	■	■	■
Hazard threat recognition	■	■	■	■	■	■	■	■
Hazard warning systems (community sirens, NOAA weather radio)	■	■	■	■	■	■	■	■
Health and safety maintenance	■	■	■	■	■	■	■	■
Post-disaster mitigation	■	■	■	■	■	■	■	■
Evacuation planning	■	■	■	■			■	
STRUCTURAL PROJECTS								
Channel maintenance		■						
Dams/reservoirs (including maintenance)	■	■						
Isolate hazardous materials waste storage sties			■					
Levees and floodwalls (including maintenance)		■						
Safe room/shelter					■	■		■
Secondary containment system			■					
Site reclamation/restoration/revegetation		■	■	■				
Snow fences								■
Water supply augmentation					■			

Mitigation Action Selection and Prioritization Criteria

Does the proposed action protect lives or vulnerable populations?

Does the proposed action address hazards or areas with the highest risk?

Does the proposed action protect critical facilities, infrastructure, or community assets?

Does the proposed action meet multiple objectives (multi-objective management)?

STAPLE/E

Developed by FEMA, this method of applying evaluation criteria enables the planning team to consider in a systematic way the social, technical, administrative, political, legal, economic, and environmental opportunities and constraints of implementing a particular mitigation action. For each action, the HMPC should ask, and consider the answers to, the following questions:

Social

Does the measure treat people fairly (different groups, different generations)? Does it consider social equity, disadvantaged communities, or vulnerable populations?

Technical

Will it work? (Does it solve the problem? Is it feasible?)

Administrative

Is there capacity to implement and manage project?

Political

Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support it?

Legal

Does your organization have the authority to implement? Is it legal? Are there liability implications?

Economic

Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development? Does it reduce direct property losses or indirect economic losses?

Environmental

Does it comply with environmental regulations or have adverse environmental impacts?

Summit County Hazard Mitigation Plan Update 2019
New Mitigation Action Worksheet

Use this sheet to record new potential mitigation projects (1 form per project) identified during the planning process. Provide as much detail as possible and use additional pages as necessary. Complete and return to Amy Carr by **December 17, 2019. Note Jurisdiction:**

Mitigation Action/Project Title	
Hazard(s) Mitigated	
Priority (High, Medium, Low)	
Project Description, Issue/Background	
Responsible Office/ Agency and partners	
Timeline for Completion	
Cost Estimate	
Benefits (Avoided Losses)	

Prepared by: _____
Title/Dept: _____
Phone: _____
Email: _____

Please return worksheets by email to:
Amy Carr
amy.carr@woodplc.com
Phone: 303-630-0796

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Open Space Council Approves Resolution in Support of Measure 1B

Ballot Measure 1B would continue the existing mill levy for open space and trails Read on...

Summit County Hosts Commercial Energy Efficiency Financing Workshop Nov. 7

Summit County encourages commercial property owners and contractors to learn about this opportunity to finance energy-saving building improvements and renewable energy installations
Read on...

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Take the Hazard Mitigation Survey

Give your input on preparing for emergencies and disasters.
Learn more...

Inspire a Young Person

We need caring adults who will provide one-on-one mentoring for local children and teens.
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Take Public Transportation

Summit Stage offers free bus service to towns and ski resorts throughout Summit County.
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Emergency Management

The mission of the Summit County Office of Emergency Management is to provide coordination of elected offices and county departments in preparedness, protection, mitigation, response, and recovery to emergencies and disasters.

Summit County Fire Restrictions

Effective Tuesday, Oct. 22, 2019, the Board of County Commissioners has lifted Stage 1 fire restrictions in Summit County. No local fire restrictions are currently in effect. View statewide fire restriction and fire danger information across Colorado.

Take Our Survey!

Summit County is in the process of updating its Hazard Mitigation Plan. We're seeking information from the public and stakeholders to better understand our vulnerabilities, as well as opportunities to reduce the impacts of hazards before they occur.

Please take this short, six-question survey by Dec. 13, 2019.

The Hazard Mitigation Plan analyzes our vulnerabilities to natural and manmade hazards and identifies proactive mitigation actions the County, towns and special districts can take to minimize impacts to people, property and critical facilities.

Local Hazard Risks

Summit County has a number of hazard risks, including avalanches, floods, wildfires and severe weather,

Contact Us

501 N. Park Ave.
P.O. Box 210
Breckenridge, CO 80424

Fax: 970-453-7329

24-7 assistance:
Ph: 970-668-8600

FAQs

- Where do I find current fire restriction information?
- How will Summit County communicate with me during an emergency?
- What is Summit County's wildfire evacuation plan?

View All

Your Government

- MAYOR'S WELCOME
- COMMENT
- COUNCILS AND COMMISSIONS
- ELECTIONS
- FRISCO COMMUNITY PLAN
- GOVERNMENT STRUCTURE
- FRISCO SUSTAINABILITY INITIATIVES
- LEGAL NOTICES
- MAPS
- MEETING CALENDAR
- MUNICIPAL COURT
- OPEN RECORDS REQUEST
- SHORT TERM RENTALS
- STAFF DIRECTORY
- SUMMIT COUNTY TELEVISION
- TOWN CODE AND TOWN CHARTER
- TOWN NEWS

TOWN NEWS

Please Take a Short Survey by December 13

December 5, 2019

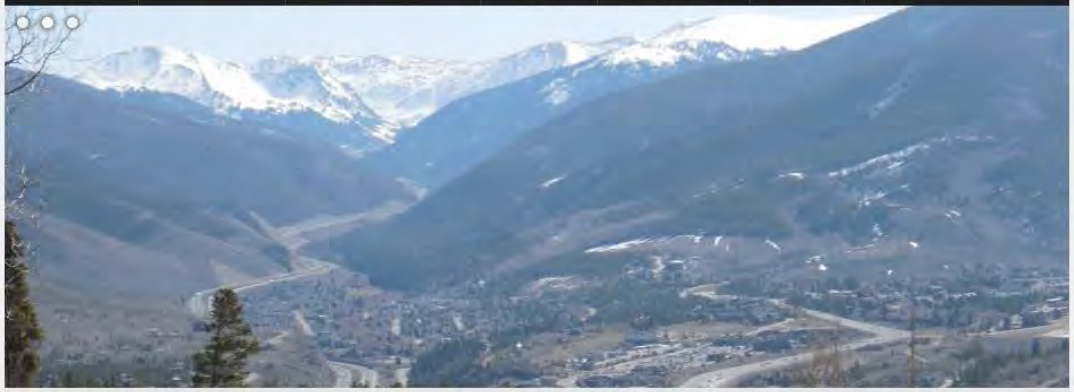
Summit County is in the process of updating the countywide emergency and disaster plans. So we need your help as we seek information from the public and stakeholders to better understand the county's vulnerabilities, as well as opportunities to reduce the impacts of hazards before they occur.

Please take this **short, six-question survey** by December 13, 2019.

The **Hazard Mitigation Plan** analyzes our vulnerabilities to natural and manmade hazards and identifies proactive mitigation actions the County, towns and special districts can take to minimize impacts to people, property and critical facilities.

BUFFALO MOUNTAIN METROPOLITAN DISTRICT

BMMD Info | Fees/Billing | Rules/Regulations | Services | Emergencies | Contact | Home



Welcome

The Buffalo Mountain Metropolitan District (BMMD), provides water, sewer, road maintenance, snow plowing, architectural review authority, and covenant enforcement services to the Wildernest subdivision. BMMD is located just West of Silverthorne at the base of beautiful Buffalo Mountain, in Summit County, Colorado. The business and affairs of BMMD is governed by a five (5) member Board of Directors and the District Manager. BMMD services nearly 2,500 residential units, condominium units, and several commercial properties.

Take the Hazard Mitigation Survey

Give your input on preparing for emergencies & disasters.Summit County is in the process of updating its Hazard Mitigation Plan. We're seeking information from the public and stakeholders to better understand our vulnerabilities, as well as opportunities to reduce the impacts of hazards before they occur. Please take this short, six-question survey by Dec. 13, 2019.

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@SummitCountyGov

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Summit County, Colorado

December 2 at 6:07 PM ·

We're updating our emergency and disaster plans, and we want your input! Tell us what you think our priorities should be when it comes to reducing risk in Summit County. Only six questions - super quick!
https://woodplc.surveymonkey.com/r/SummitHMP

49

3 Comments 7 Shares

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Summit County, Colorado

December 2 at 5:56 PM ·

We're updating our emergency and disaster plans, and we want your input! Tell us what you think our priorities should be when it comes to reducing risk in Summit County. Only six questions - super quick! https://woodplc.surveymonkey.com/r/SummitHMP Summit County Sheriff's Office Town of Frisco, Colorado Government Town of Breckenridge, CO Government Silverthorne Colorado Red, White & Blue Fire Protection District Summit Fire & EMS

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We're updating our emergency and disaster plans, and we want your input! Tell us what you think our priorities should be when it comes to reducing risk in #SumCO. Only six questions - super quick! woodplc.surveymonkey.com/r/SummitHMP

5:52 PM - 2 Dec 2019

2 Retweets **2** Likes

2 2

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Town of Frisco, Colorado Government shared a post.
December 3 at 11:50 AM ·

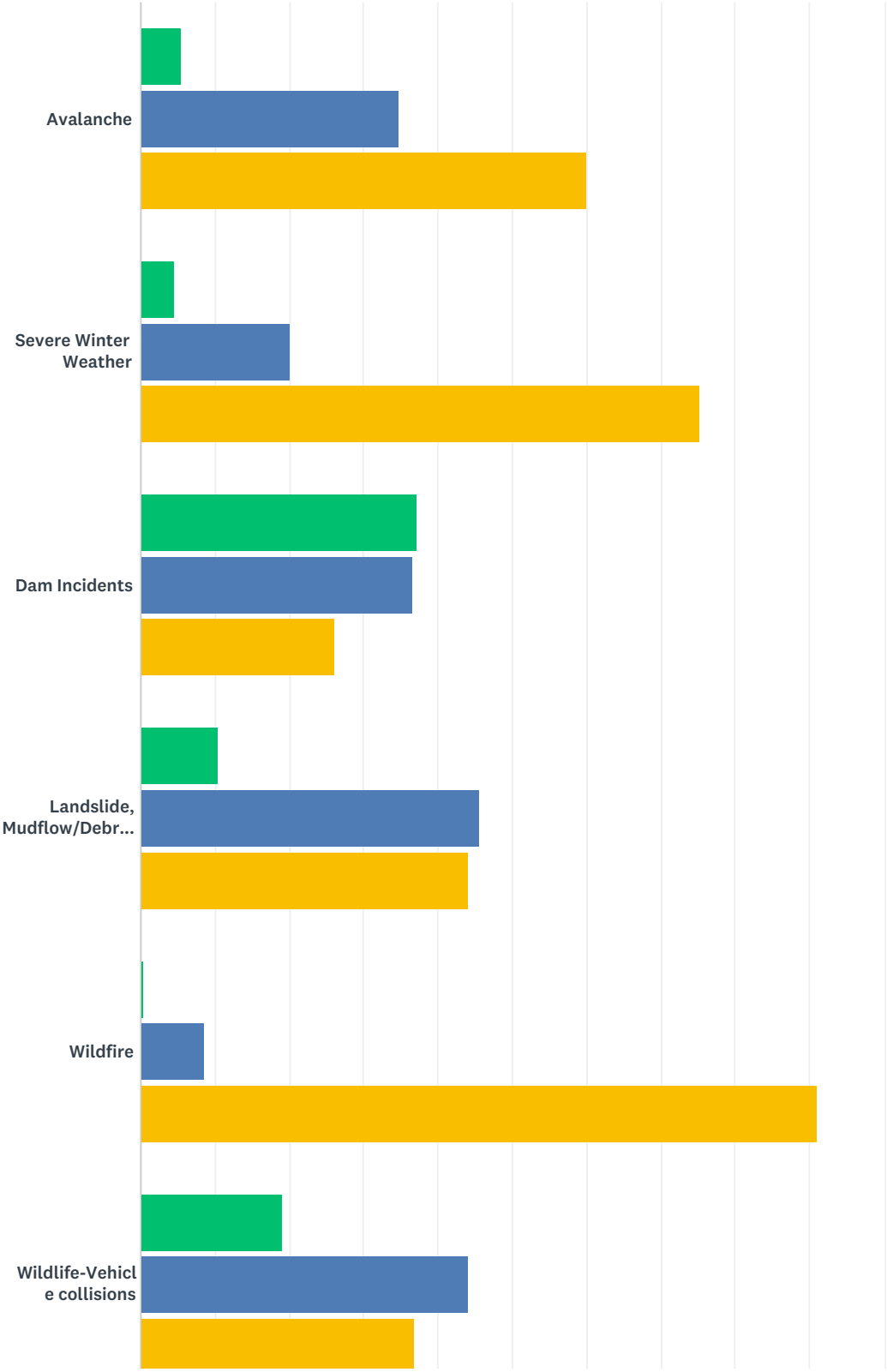
Quick survey- Summit County needs your input!

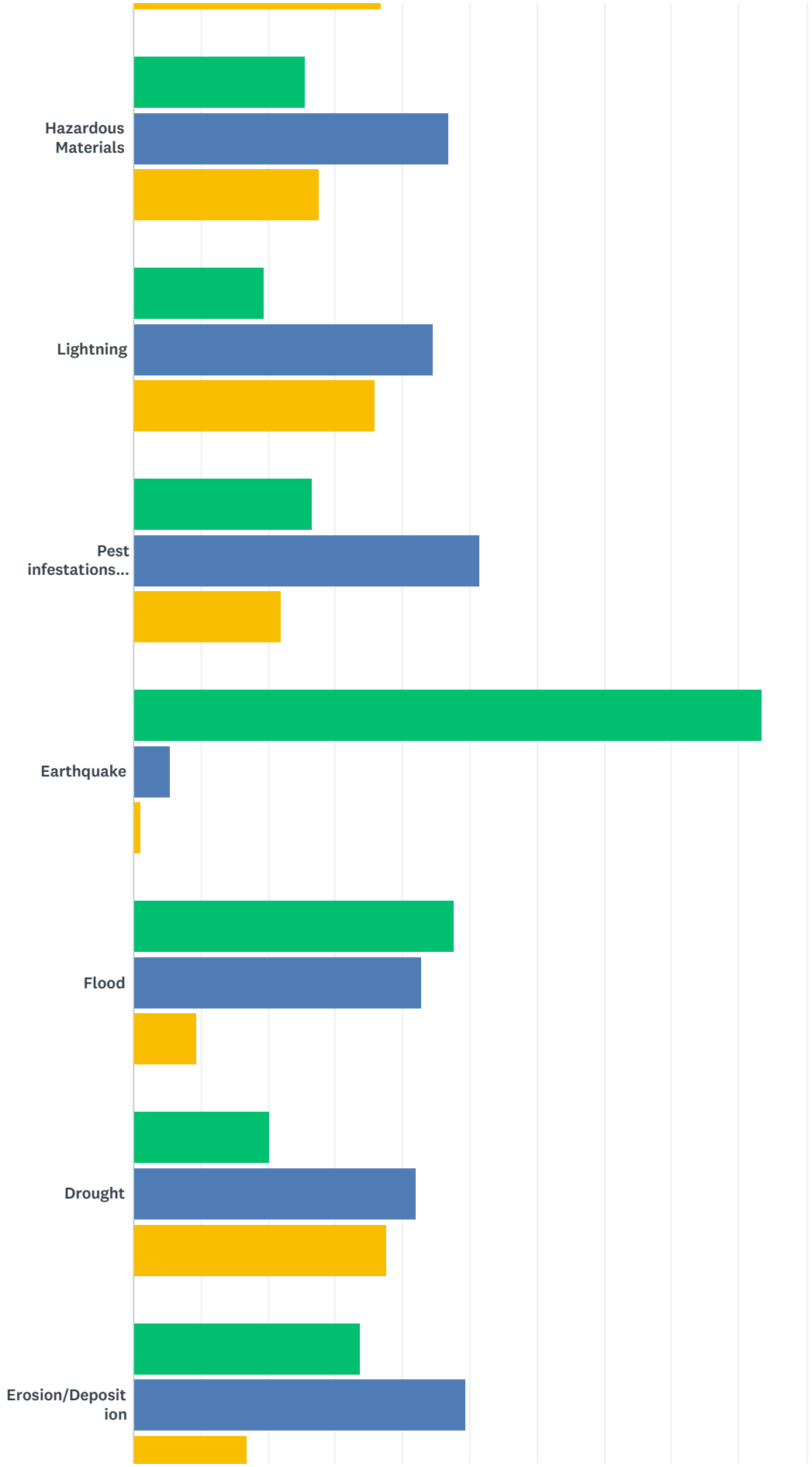
Summit County, Colorado
December 2 at 5:56 PM ·

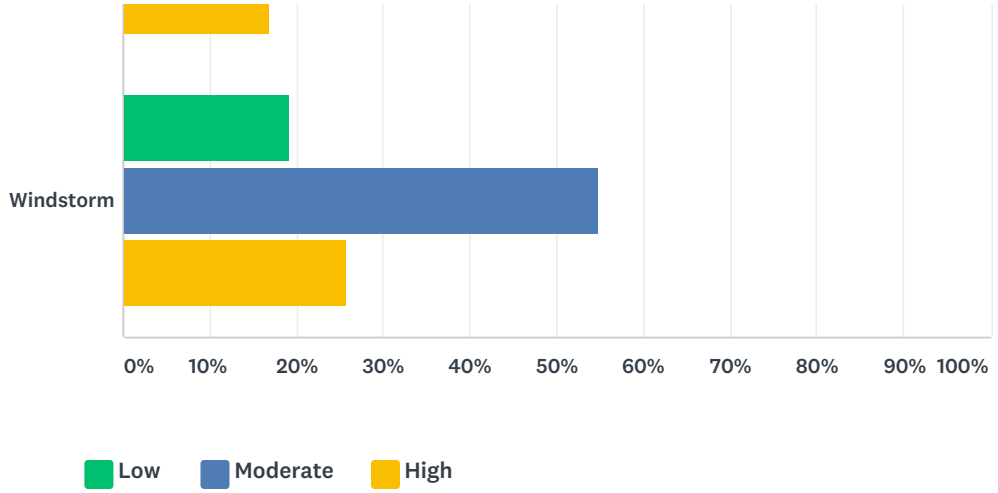
We're updating our emergency and disaster plans, and we want your input! Tell us what you think our priorities should be when it comes to reducing risk in Summi...
See More

Q1 The hazards addressed in the Hazard Mitigation Plan update are listed below. Please indicate the level of significance in Summit County that you perceive for each hazard.

Answered: 280 Skipped: 1




Hazardous Materials
Lightning
Pest infestations...
Earthquake
Flood
Drought
Erosion/Deposition



	LOW	MODERATE	HIGH	TOTAL	WEIGHTED AVERAGE
Avalanche	5.36% 15	34.64% 97	60.00% 168	280	2.55
Severe Winter Weather	4.64% 13	20.00% 56	75.36% 211	280	2.71
Dam Incidents	37.28% 104	36.56% 102	26.16% 73	279	1.89
Landslide, Mudflow/Debris Flow, Rock Fall	10.39% 29	45.52% 127	44.09% 123	279	2.34
Wildfire	0.36% 1	8.60% 24	91.04% 254	279	2.91
Wildlife-Vehicle collisions	19.00% 53	44.09% 123	36.92% 103	279	2.18
Hazardous Materials	25.54% 71	46.76% 130	27.70% 77	278	2.02
Lightning	19.42% 54	44.60% 124	35.97% 100	278	2.17
Pest infestations (forest and aquatic)	26.62% 74	51.44% 143	21.94% 61	278	1.95
Earthquake	93.50% 259	5.42% 15	1.08% 3	277	1.08
Flood	47.65% 132	42.96% 119	9.39% 26	277	1.62
Drought	20.29% 56	42.03% 116	37.68% 104	276	2.17
Erosion/Deposition	33.70% 93	49.28% 136	17.03% 47	276	1.83
Windstorm	19.27% 53	54.91% 151	25.82% 71	275	2.07

#	OTHER (PLEASE SPECIFY)	DATE
1	Traffic when I-70 closes on winter weekends= High hazard	12/10/2019 9:19 PM
2	ice sstorm, power outage	12/7/2019 1:29 PM
3	traffic volume and gridlock	12/7/2019 4:29 AM
4	Poor air quality from wildfire smoke coming from other regions	12/7/2019 12:50 AM

5	Uneducated tourists and front range fools pertaining to fire restrictions, road hazards / ice and snow, wildlife encounters, and the idea that a dirt road is a hiking trail, sledding hill, parking lot, etc.	12/7/2019 12:19 AM
6	Climate change (related to all, but needs to be specfically addressed as other hazards are identified)	12/6/2019 3:36 PM
7	Vehicle-vehicle collisions due to increasing traffic	12/6/2019 2:31 PM
8	Water Source Contamination	12/6/2019 8:09 AM
9	Air quality	12/5/2019 5:28 PM
10	Infectious Disease Outbreak, Mass Casualty Incidents	12/4/2019 3:39 PM
11	Need to put some effort into educating residents, businesses, churches and other organizations in active shooter/violence prevention and response	12/4/2019 1:40 PM
12	I-70 Shutdowns causing gridlock in the county	12/3/2019 11:50 PM
13	People infestation	12/3/2019 10:35 PM
14	Please do something to upgrade travel conditions on American Way/Ski Hill Road through Peak 7. It is tolerable during the winter months due to the snowpack, but heavily traveled and impassable during much of the remainder of the year.	12/3/2019 5:44 PM
15	Road conditions on Peak 7	12/3/2019 5:18 PM
16	Survey people on non-natural disasters/hazards (e.g. cybersecurity)	12/3/2019 5:44 AM
17	Evacuation during wildfire or other emergency.	12/3/2019 3:03 AM

Q2 Do you have information on specific hazard issues/problem areas that you would like the planning committee to consider? Note the jurisdiction to which it applies:

Answered: 100 Skipped: 181

#	RESPONSES	DATE
1	Traffic congestion on highway 6 when I-70 closes in the winter. The highway becomes a parking lot through dillon and Silverthorne. It's impossible to go anywhere. Could cause problems for emergency vehicles.	12/10/2019 9:21 PM
2	Flooding near intersection of Airport Rd./Barton Rd. (S.C. jurisdiction) Airport Rd./Floradora Rd. (Town of Breck. jurisdiction), failure of Goose Pasture Tarn Dam (Town of Blue River jurisdiction), wildfire in the Indiana Creek drainage affect on Breckenrige area water quality (Town of Blue River jurisdiction).	12/10/2019 6:44 PM
3	Visitor education	12/10/2019 5:30 PM
4	None	12/10/2019 4:29 PM
5	If there ever is a forest fire in Laskey Gulch south of I-70, the resulting post-fire debris flows could plug the culvert at the I-70 embankment. This would compromise I-70 and Straight Creek Water supply. It would be beneficial if this were turned into a wildlife crossing with a wider opening. This would eliminate the threat of a plugged culvert and embankment failure, while also breaking the I-70 wildlife barrier between the tunnel and Silverthorne.	12/10/2019 3:21 PM
6	All of summit county... start logging. We all know as locals you don’t care about the matter... it’s just a matter of time thatcsummit county turns into a fire pit and it’s going to be to late because the forest service isn’t doing their job	12/10/2019 6:40 AM
7	Dillon Dam. I live in Silverthorne and I have no clue what to do, where to go, etc if the dam starts breaking. That type of information should be available for anyone living below the dam.	12/8/2019 5:25 AM
8	Better and faster notifications and updates	12/8/2019 12:58 AM
9	Evacuation plans for residents	12/7/2019 11:40 PM
10	Yes, proposals by informed politicians suggesting to allow hazmat vehicles through the tunnels	12/7/2019 10:13 PM
11	Goose Pasture Tarn Dam	12/7/2019 9:28 PM
12	Yes.	12/7/2019 8:36 PM
13	N/a	12/7/2019 5:32 PM
14	no	12/7/2019 4:37 PM
15	no	12/7/2019 1:29 PM
16	Air quality from wildfires in the area and outside local area.	12/7/2019 12:51 AM
17	People sledding on snow packed roads in Peak 7, escape route from town of Breckenridge in case of evacuation, traffic issues resulting from goosenecking views, wildlife, smoke, etc.	12/7/2019 12:22 AM
18	It is obvious that the dead trees throughout Summit County present a large fire risk. The large fire breaks up in Wildernest were the saving grace in 2018 that we did not lose the subdivision. A continued effort to address this challenge is one of the biggest priorities for Summit County.	12/6/2019 8:32 PM
19	Not at this time.	12/6/2019 6:50 PM
20	None.	12/6/2019 6:04 PM
21	N/A	12/6/2019 6:00 PM
22	Road durability, construction, longevity	12/6/2019 4:50 PM

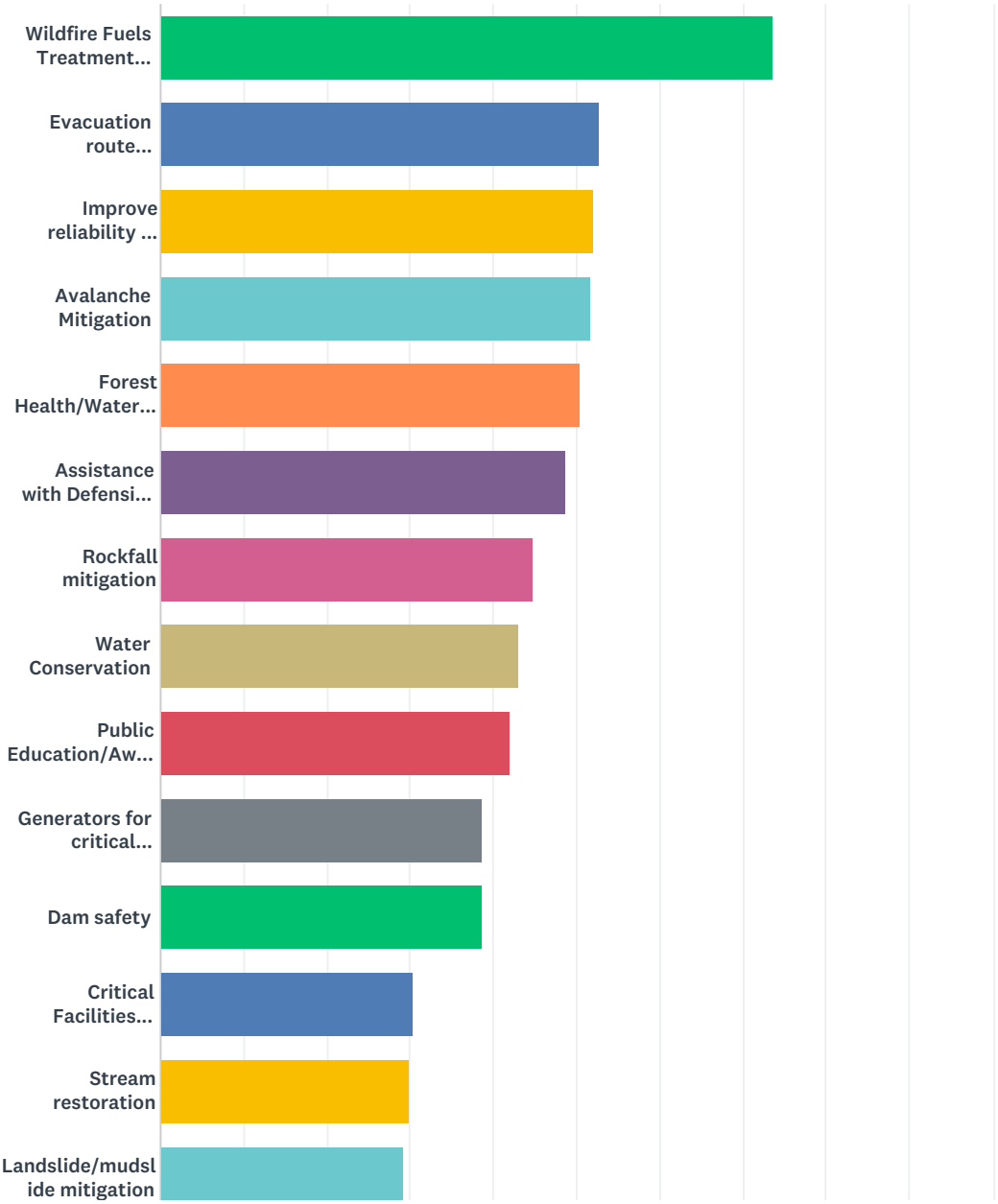
23	I know it's technically Denver Water and may not be Summit County specific, but I just want to make sure our inspections and maintenance of the dam are thorough. I don't have any reason to believe they aren't, I just look at it sometimes and think how bad it would be if that thing ever gave out (especially for Silverthorne)	12/6/2019 4:31 PM
24	No	12/6/2019 3:47 PM
25	Climate change	12/6/2019 3:37 PM
26	Imminent Fire Hazard due to Beetle kill alongside and between I-70 and homes (both the threat of fire from the interstate and the small amount of distance between the interstate and homes). - Copper Mtn.	12/6/2019 3:35 PM
27	A wildfire in the north ten mile creek. The Town of Frisco's source water for our water treatment plant is located in that area of the White River National Forest.	12/6/2019 3:28 PM
28	flooding-Frisco	12/6/2019 3:13 PM
29	No	12/6/2019 2:31 PM
30	The widening of the highway by the hospital near Frisco. It is already chaos	12/6/2019 12:27 PM
31	No	12/6/2019 7:23 AM
32	poor emergency response due to high volume traffic	12/6/2019 12:03 AM
33	Wildfire mitigation with climate change	12/6/2019 12:02 AM
34	The lack of egress on Highway 6 northbound when I70 closes	12/5/2019 11:58 PM
35	wildfires (Frisco/Ten Mile Basin/ Summit County)	12/5/2019 11:49 PM
36	No	12/5/2019 11:16 PM
37	no	12/5/2019 10:07 PM
38	Evacuations and traffic. Both ends of the county but especially Breckenridge	12/5/2019 9:28 PM
39	town responsibilty for infrastructure issues	12/5/2019 9:02 PM
40	County, nuclear waist in Dam, slim but region wide impact	12/5/2019 8:47 PM
41	No	12/5/2019 8:28 PM
42	Not at this time	12/5/2019 8:16 PM
43	Blue river flooding in breckenridge	12/5/2019 7:50 PM
44	none	12/5/2019 6:29 PM
45	Air quality	12/5/2019 5:28 PM
46	Na	12/5/2019 4:33 PM
47	Involving Summit fire fire fighters with property walks. The guy who does it now is not a fire fighter.	12/5/2019 3:39 PM
48	No	12/5/2019 1:52 PM
49	Fire danger in all “micro communities” wildernest, blue river, ptarmigan, montezuma, north 40, french creek	12/5/2019 3:37 AM
50	Power outage	12/4/2019 9:44 PM
51	No	12/4/2019 3:13 PM
52	One thing that intrigues is that there is only one road to get through a lot of our mountain communities. And when an emergency happens so many people are stranded. Especially when visitors in our community are stranded.	12/4/2019 3:06 PM
53	county - number of short term rentals allowed contributes to our hazards with their lack of knowledge and the congestion in causes if an evacuation/emergency were to occur	12/4/2019 3:02 PM
54	No	12/4/2019 2:25 PM
55	Dust and mag chloride poisoning, Peak 7	12/4/2019 2:20 PM
56	No	12/4/2019 1:52 PM

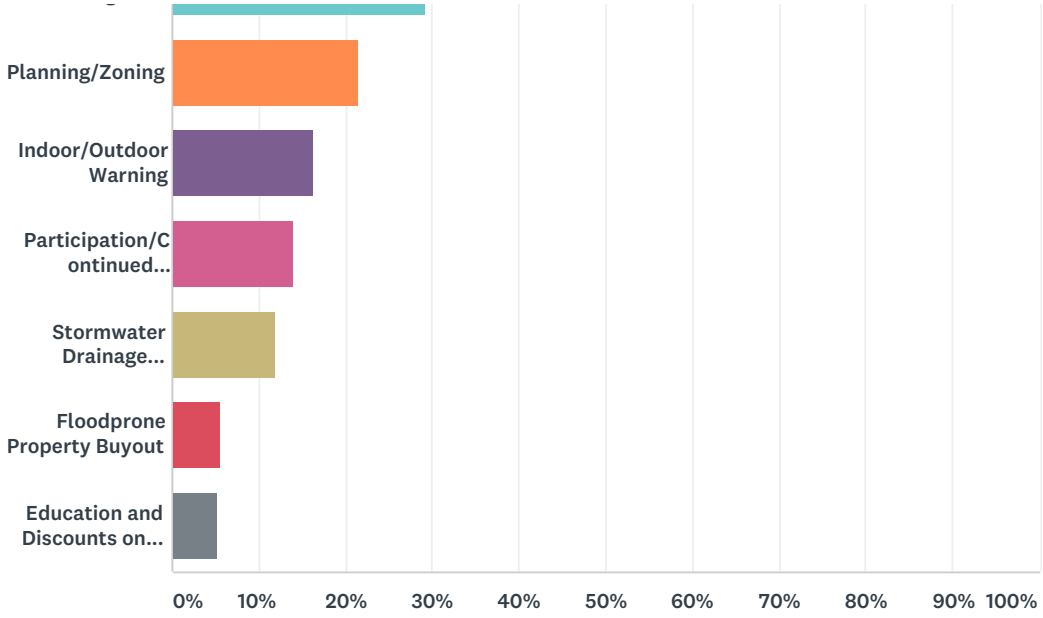
57	Need to put some effort into educating residents, businesses, churches and other organizations in active shooter/violence prevention and response	12/4/2019 1:40 PM
58	Highway Closure Information - CDOT	12/4/2019 3:05 AM
59	Emergency Lodging when avalanches occur and guests/employees are stranded due to highway closures.	12/4/2019 1:32 AM
60	Pre-identify area that can house heavy helicopters for wildfire suppression. I am a USFS helicopter manager and we got lucky on the Buffalo Fire by assuming the usage of Smith Ranch for helibase. Identify and communicate these locations to Grand Junction Interagency Dispatch.	12/4/2019 12:43 AM
61	Wildlife on I-70 corridor. Limited egress in case if emergency evacuations. Traffic when I-70 shuts down interferes w/emergency traffic.	12/4/2019 12:14 AM
62	In town gridlock due to I-70 closures... makes getting around the county impossible and unsafe in emergencies	12/3/2019 11:51 PM
63	lighting along hw 91 would be nice	12/3/2019 11:02 PM
64	I-70 should be equipped with better reflectors between lanes and the lines repainted. At night during bad weather it is impossible to see the different lanes while driving	12/3/2019 10:22 PM
65	Peak 7 road conditions are beyond need of updating.	12/3/2019 10:20 PM
66	nothing specific	12/3/2019 10:11 PM
67	Beattle Kill Treas	12/3/2019 10:06 PM
68	Not at this time	12/3/2019 9:56 PM
69	no	12/3/2019 9:55 PM
70	more communication on wildfires, current bans,	12/3/2019 9:54 PM
71	no	12/3/2019 9:33 PM
72	Wildfire	12/3/2019 9:19 PM
73	Additional road routes, Eliminate restrictions to vehicles on Dam road	12/3/2019 9:03 PM
74	The residents on the east side of HWY 9 along and above Rainbow Drive have only 2 very restricted exits out of our neighborhood even though we are close to the highway and interstate. It would be prudent to put at least one more bridge to the north end.	12/3/2019 8:55 PM
75	Peak 7- American Way/Ski Hill Road thoroughfare	12/3/2019 5:45 PM
76	Peak 7 road conditions	12/3/2019 5:18 PM
77	No	12/3/2019 3:01 PM
78	I question the ability to evacuate with limited egress and the number of tourists. Even the road closures for snow and accidents create issues and those are minor in comparison to a real crisis.	12/3/2019 1:50 PM
79	Wildfire	12/3/2019 1:33 PM
80	Wild life interactions in incorporated summit like Summit Cove Trailer Park	12/3/2019 7:29 AM
81	Wildlife vehicle collisions; county wide	12/3/2019 6:07 AM
82	Countywide, cybersecurity	12/3/2019 5:44 AM
83	I would like to see the fire dept at Copper designated as a shelter, warming station as it was before Dillon took over.	12/3/2019 4:31 AM
84	Traffic and the inability to go through Silverthorne when the interstate closses	12/3/2019 4:21 AM
85	Peak 7 roads potholes, mud, ice in winter	12/3/2019 4:11 AM
86	Lack of exit routes in blue river	12/3/2019 4:05 AM
87	Evacuation during any natural disaster	12/3/2019 3:57 AM
88	No	12/3/2019 3:18 AM
89	Evacuation in Breckenridge	12/3/2019 3:03 AM
90	Goose pasture tarn damn	12/3/2019 2:53 AM

91	Unnecessary road closures across the county. Roads are often closed for snowstorms when they truly are not unsafe, causing meaningless delays	12/3/2019 2:44 AM
92	Rwb fire	12/3/2019 2:35 AM
93	Ability for evacuation should any of these events occur or places to shelter in place when can't make it home	12/3/2019 2:32 AM
94	In the Hoosier pass area, many roads with high grade are not maintained.	12/3/2019 2:31 AM
95	Squatters in the National Forest leaving fires unattended	12/3/2019 2:16 AM
96	Evacuation	12/3/2019 2:13 AM
97	Forest fires	12/3/2019 2:11 AM
98	Traffic flow during peak times of year and lack of infrastructure to solve this issue. County wide..	12/3/2019 2:07 AM
99	Fire risk to wildernest/Mesa cortina in Silverthorne. Good job June 2018	12/3/2019 2:04 AM
100	Wealthy people build their homes right up against the forest, then they whine about fuel mitigation projects.	12/3/2019 1:04 AM

Q3 Mitigation is defined as actions that can be taken to reduce or eliminate the long-term risk to hazards, prior to an event occurring. One example of a mitigation action in our community is a proposed rehabilitation project of the Goose Pasture Dam to reduce the risk of failure and protect the Town of Breckenridge. This multi-million dollar project is currently being considered for a FEMA grant.The following types of mitigation actions may also be considered in Summit County. Please indicate the types of mitigation actions that you think should have the highest priority in the Summit County Hazard Mitigation Plan.

Answered: 250 Skipped: 31





ANSWER CHOICES	RESPONSES	
Wildfire Fuels Treatment projects	73.60%	184
Evacuation route development	52.80%	132
Improve reliability of communications systems	52.00%	130
Avalanche Mitigation	51.60%	129
Forest Health/Watershed Protection	50.40%	126
Assistance with Defensible Space	48.80%	122
Rockfall mitigation	44.80%	112
Water Conservation	43.20%	108
Public Education/Awareness	42.00%	105
Generators for critical facilities	38.80%	97
Dam safety	38.80%	97
Critical Facilities Protection	30.40%	76
Stream restoration	30.00%	75
Landslide/mudslide mitigation	29.20%	73
Planning/Zoning	21.60%	54
Indoor/Outdoor Warning	16.40%	41
Participation/Continued Participation in the National Flood Insurance Program	14.00%	35
Stormwater Drainage Improvements	12.00%	30
Floodprone Property Buyout	5.60%	14
Education and Discounts on Flood Insurance	5.20%	13
Total Respondents: 250		

Q4 Please comment on any other pre-disaster mitigation actions that the planning committee should consider for reducing future losses caused by natural disasters:

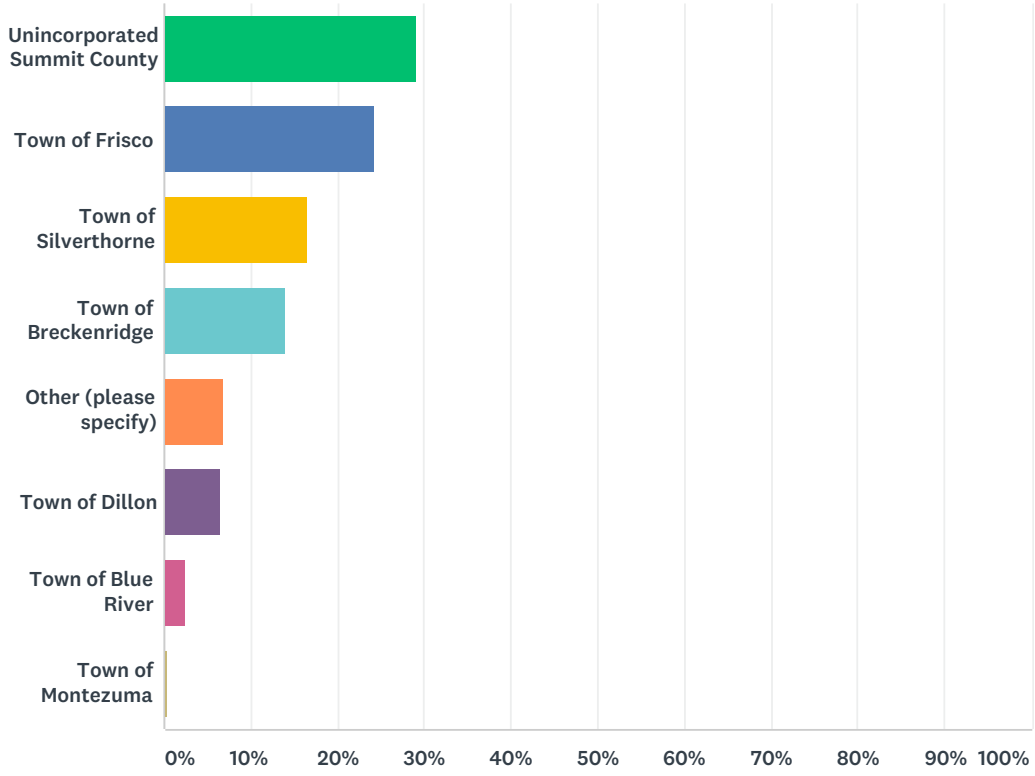
Answered: 47 Skipped: 234

#	RESPONSES	DATE
1	cutting around critical structures that should be defended.	12/12/2019 11:56 PM
2	Zoning for less density in the wildland-urban interface.	12/10/2019 6:47 PM
3	Committee should consider actions that have a favorable cost-benefit relationship and reduce risk (as defined by the probability of an event and the consequence of the event).	12/10/2019 3:24 PM
4	Ban campfires year round in the Eagles Nest Wilderness	12/8/2019 5:28 AM
5	Letter will be sent separately.	12/7/2019 8:39 PM
6	n/a	12/7/2019 5:36 PM
7	Fund and/or encourage cell phone companies to install more towers to provide better coverage when land-line communication methods are not available. For example, a recent Verizon tower installed in Eagles Nest still provides almost no coverage at the top of the neighborhood and surrounding forests.	12/7/2019 5:30 PM
8	fuel reduction - clear cut perimeter of towns	12/7/2019 4:40 PM
9	Visitor and non-full time local education	12/7/2019 12:27 AM
10	Identifying and addressing wildfire danger.	12/6/2019 8:42 PM
11	Fire mitigation is upmost concern for me.	12/6/2019 6:55 PM
12	CodeRed	12/6/2019 6:05 PM
13	N/A	12/6/2019 6:01 PM
14	Keeping changing weather patterns in mind with avalanche mitigation as to avoid incidents like last year, however unlikely.	12/6/2019 3:50 PM
15	Our emergency evacuation plan for the county seems ripe for complete chaos. Say a disaster should occur on a Fri-Sun? Every single weekend our road ways are clogged due to traffic surge and if there is an actual emergency the sheer volume of cars on the roadway would absolutely cripple our ability to flee	12/6/2019 3:41 PM
16	rapid climate action to reduce increased stress on all our natural systems	12/6/2019 3:38 PM
17	Shelters in each community during disasters.	12/6/2019 3:37 PM
18	Defensible space	12/6/2019 3:36 PM
19	More enforcement on existing mitigation-related laws, i.e. fire restrictions and traciton laws.	12/6/2019 2:33 PM
20	Communication on rockfall mitigation especially when the county decides to do mitigation over a holiday weekend!!	12/6/2019 12:30 PM
21	controlling the tourism population	12/6/2019 12:06 AM
22	Wildfire education and fire bans all summer	12/6/2019 12:04 AM
23	n/a	12/6/2019 12:00 AM
24	county-wide defensible space	12/5/2019 11:50 PM
25	Detailed, published, and workable evacuation plans	12/5/2019 10:57 PM
26	None at this time	12/5/2019 8:18 PM
27	Na	12/5/2019 4:36 PM

28	Clearing all dead down and standing	12/5/2019 3:45 PM
29	Give people the tools and education to the people, because they aren't going to seek them out themselves...sadly	12/5/2019 3:40 AM
30	anything for wildfire	12/4/2019 9:46 PM
31	Runoff collection ponds below "popular" hazmat accident sites to minimize damages. Loveland pass hairpins, runaway truck ramps, etc. Or other motor vehicle accident prone area improvements.	12/4/2019 2:31 PM
32	Improve access for emergency vehicles by paving Peak 7	12/4/2019 2:21 PM
33	na	12/4/2019 1:55 PM
34	Hardening of Telecom links in and out of the county.	12/4/2019 3:11 AM
35	Evacuation preparedness	12/4/2019 12:44 AM
36	Evacuation Drills - avoid same problem as Paradise CA	12/3/2019 11:35 PM
37	forrest service removal of beattel kill	12/3/2019 11:04 PM
38	nothing specific	12/3/2019 10:12 PM
39	none at this time	12/3/2019 9:57 PM
40	avalanche zone signs on i-70 and hwhy 91, like they have east of Loveland	12/3/2019 9:56 PM
41	Additional road connections in summit county to provide alternative routes	12/3/2019 9:06 PM
42	I think wildfire was s the big great threat	12/3/2019 4:24 AM
43	Where people evacuated can go, partnerships with other counties if the whole/most county needs evacuation	12/3/2019 2:36 AM
44	Public awareness of evacuation plans, wildfire mitigation.	12/3/2019 2:16 AM
45	We need to police the forest with all the people who live out there and camp that are leaving fires burning and who do not adhere to the bans.	12/3/2019 2:14 AM
46	Education	12/3/2019 2:13 AM
47	Advocating for steep emissions reductions at the state and federal levels to mitigate against climate change. Incentives for solar installations and battery storage to reduce vulnerability to power outages.	12/3/2019 1:10 AM

Q5 Indicate the community you live in

Answered: 248 Skipped: 33



ANSWER CHOICES	RESPONSES	
Unincorporated Summit County	29.03%	72
Town of Frisco	24.19%	60
Town of Silverthorne	16.53%	41
Town of Breckenridge	14.11%	35
Other (please specify)	6.85%	17
Town of Dillon	6.45%	16
Town of Blue River	2.42%	6
Town of Montezuma	0.40%	1
TOTAL		248

#	OTHER (PLEASE SPECIFY)	DATE
1	I live in Leadville but work for Town of Frisco.	12/7/2019 5:37 PM
2	Silversheckle	12/6/2019 3:42 PM
3	Dillon Valley	12/6/2019 3:37 PM
4	Buena Vista	12/5/2019 11:19 PM
5	Littleton	12/5/2019 4:37 PM
6	(CMCMD) Copper Mountain Resort	12/4/2019 3:09 PM

7	Breckenridge, Peak 7	12/4/2019 2:22 PM
8	Copper Mountain	12/4/2019 1:21 AM
9	Summit Cove	12/3/2019 11:40 PM
10	leadville	12/3/2019 11:04 PM
11	Copper Mountain	12/3/2019 10:11 PM
12	Copper	12/3/2019 10:08 PM
13	Copper Mountain	12/3/2019 10:03 PM
14	Keystone	12/3/2019 12:33 PM
15	Copper	12/3/2019 6:00 AM
16	Wildernest	12/3/2019 2:39 AM
17	I live in Park now but we have the same issues here. When we had the fire in Breck one of the fireman said that if the town were to go up in flames people will burn alive because the infrastructure can't handle a mass exodus. It scares me for all of summit county.	12/3/2019 2:15 AM

Q6 Optional: Provide your name and email address if you would like to be added to a distribution list for upcoming activities related to the planning process:

Answered: 37 Skipped: 244

#	RESPONSES	DATE
1	[redacted]	

[redacted]

From: Brian Bovaird <Brian.Bovaird@summitcountyco.gov>
Sent: Thursday, February 20, 2020 7:48 AM
To: Aaron Byrne; Addison Canino (addisonc@townoffrisco.com); Ali Richards (alisonrichards@fs.fed.us); Carr, Amy; Bec Bale (bbale@coppercolorado.com); Becky Franco; Bill Gibson (billg@townoffrisco.com); Bill Jackson (wfjackson@fs.fed.us); Birch Barron (birch.barron@eaglecounty.us); blair@summitchamber.org; Brian Lorch; Brislawn, Jeff P; Bruce Farrell; Bryan Webinger; Cailee Hamm - Lake County OEM (lakecountyoem@gmail.com); Chris Shelden (cshel@silverthorne.org); Ciazza, Lisa; Dan Hendershott; Dan Schroder (dan.schroder@colostate.edu); Dana Miller; David Askeland (daskeland@coloradomtn.edu); David Paradysz (dparadysz@vailresorts.com); Deborah Polich; Deric Gress (dericg@townofbreckenridge.com); Doozie Martin (doozie@fdrd.org); Drew Adkins; Drew Petersen (drew.petersen@state.co.us); Ellen Reid (ereid@keystonescienceschool.org); Ethan Greene (ethan.greene@state.co.us); Flenniken, Kelly; Fritz Homann (william.homann@state.co.us); Howard Hallman (future1946@yahoo.com); James Donlon; James Phelps (jamesp@townofbreckenridge.com); Jamie Yount (jamie.yount@state.co.us); Jared Rapp (jared.rapp@state.co.us); Jay Nelson; Jeanne Bistranin (jeanne@summitfoundation.org); Jeff Berino; Jeff Goble (jeffg@townoffrisco.com); Jeff Leigh - Mesa Cortina Water and Sewer District; Jeff Zimmerman; Jeffrey Huntley; jhall@summitfire. org (jhall@summitfire.org); Jim Baird - Breckenridge Police Department (JBaird@townofbreckenridge.com); Jim Curnutte; John Blackwell (john.blackwell@denverwater.org); Johnson, Tyler; Julie Sutor; julie.mccluskie.house@state.co.us; Kathie Atencio (atencio.kathie@epa.gov); Kathleen Krebs (kkrebs@co.clear-creek.co.us); Kevin Houck (kevin.houck@state.co.us); Mark Thompson (DHSEM); Mark Watson; MarkHeminghous@TownofDillon.com; Matt Willitts; mayorzuma@gmail.com; 'Michelle Eddy'; Nancy Kerry (nancyk@townoffrisco.com); Patricia Gavelda (patricia.gavelda@state.co.us); Rick Speer; rickh@townofbreckenridge.com; Robert Jacobs; Ryan Hyland; Sarah Vaine; Scott Hill; Scott O'Brien; Scott Reid; Shellie Duplan; Susan Alexander (sjalexander@csu.org); Tamara Drangstveit (TamaraD@summitfirc.org); Tara Gourdin; Tom Daugherty (tdaugherty@silverthorne.org); Tom Gosiorowski; Tom Oberheide; Tony Cammarata (tonyc@a-basin.net); Treste Huse - NOAA Federal; Troy Wineland
Subject: Draft Mitigation Plan Public Review

Good morning,
A draft of the updated Hazard Mitigation Plan has been uploaded to the county webpage for public review and comment until March 3rd (www.summitcountyco.gov/emergencymanagement). Along with the plan is a link for a survey. There will be a press release that goes out today, detailing this information. Please encourage your networks to review the plan and provide feedback through the online survey.

Regards,
Brian

SUMMIT COUNTY
COLORADO

Brian Bovaird, MA., CEM
Director of Emergency Management

208 E. Lincoln Avenue | P.O. Box 68 | Breckenridge, CO 80424
970.668.2999 (o) | 970.485.5339 (c) | 970.453.3535 (f)

SUMMIT COUNTY
COLORADO

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- Hazard Risks
- Preparedness
- Summit County Alert
- Emergency Blog
- Blog de Emergencia

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Emergency Management

The mission of the Summit County Office of Emergency Management is to provide coordination of elected offices and county departments in preparedness, protection, mitigation, response, and recovery to emergencies and disasters.

Draft Hazard Mitigation Plan Update

Summit County is in the process of updating our hazard mitigation plan. We welcome feedback and input from the community. Read the draft plan (pdf).

Complete a survey to provide feedback on the draft plan.

Summit County Fire Restrictions

Effective Tuesday, Oct. 22, 2019, the Board of County Commissioners has lifted Stage 1 fire restrictions in Summit County. View statewide fire restriction and fire danger information across Colorado.

Local Hazard Risks

Summit County has a number of hazard risks, including avalanches, floods, wildfires and severe weather, among others. Learn more about hazard risks in Summit County.

County Hazard Mitigation Plan Update

Summit County is seeking public input on the updated Summit County Hazard Mitigation Plan. The plan assesses the risks posed by natural and man-made hazards and identifies ways to reduce those risks.

This plan outlines what Summit County is doing to minimize the impacts of floods, avalanches, wildfires, hazardous materials incidents and other hazards," Summit County Emergency Management Director Brian Bovaird said.

During the past five months, a hazard mitigation planning committee updated the plan with assistance from a consultant. The committee includes representatives from various County departments, all local municipalities, various special districts and other stakeholders.

The plan identifies hazard mitigation goals and a variety of mitigation projects, with the intent of reducing losses from hazard events before they occur. The planning committee is now soliciting public comment on the plan before it is finalized and submitted for review and approval by the Federal Emergency Management Agency.

The draft plan can be found online at www.SummitCountyCO.gov/emergencymanagement. Public comments on the draft plan are due by March 3.

#1

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, February 25, 2020 8:19:16 AM
Last Modified: Tuesday, February 25, 2020 8:19:29 AM
Time Spent: 00:00:12
IP Address: 70.89.162.141

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#2

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, February 25, 2020 10:47:10 AM
Last Modified: Tuesday, February 25, 2020 10:47:30 AM
Time Spent: 00:00:20
IP Address: 70.89.162.141

Page 2: Affiliation

Q1 Select affiliation (select one): **Government - Local**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#3

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, February 25, 2020 9:20:15 AM
Last Modified: Tuesday, February 25, 2020 11:10:25 AM
Time Spent: 01:50:09
IP Address: 70.89.162.141

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here:

Please finish the first paragraph on page 3-29. Unable to locate where these faults are depicted?

Page 3-34: "Common types of flooding that can occur in Summit County..." Add Ice Dams/Jams

Page 3-41: "Spring 1996—Flooding occurred on the Blue River in Breckenridge and on Straight Creek in Dillon Valley. Straight Creek Drive was washed out and has since been repaired with a culvert." To be consistent with other statements in this section: Straight Creek Drive was washed out and a larger culvert was installed and should mitigate future events.

Page 3-43: The Right to Know Network (www.rtk.net), unable to open website.

Page 3-44: Why wouldn't Copper Mountain be on the Tier II list?

Old Dillon Reservoir is not mentioned as contributing to a potential hazard, such as flooding, contamination. etc.

#4

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, February 27, 2020 8:02:03 AM
Last Modified: Thursday, February 27, 2020 8:02:29 AM
Time Spent: 00:00:25
IP Address: 107.77.201.150

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#5

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, February 27, 2020 9:47:10 AM
Last Modified:	Thursday, February 27, 2020 9:47:39 AM
Time Spent:	00:00:29
IP Address:	98.102.248.18

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#6

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, February 27, 2020 1:05:49 PM
Last Modified:	Thursday, February 27, 2020 1:06:24 PM
Time Spent:	00:00:34
IP Address:	73.203.52.254

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#7

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, February 27, 2020 2:25:00 PM
Last Modified: Thursday, February 27, 2020 2:25:30 PM
Time Spent: 00:00:30
IP Address: 96.81.49.174

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#8

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, February 28, 2020 7:28:47 AM
Last Modified: Friday, February 28, 2020 7:29:07 AM
Time Spent: 00:00:19
IP Address: 104.51.217.4

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#9

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, February 28, 2020 8:27:41 AM
Last Modified:	Friday, February 28, 2020 8:28:08 AM
Time Spent:	00:00:27
IP Address:	162.228.246.79

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#10

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, February 28, 2020 1:40:59 PM
Last Modified:	Friday, February 28, 2020 1:42:43 PM
Time Spent:	00:01:44
IP Address:	104.129.202.51

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here:

v

#11

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, February 28, 2020 5:15:26 PM
Last Modified: Friday, February 28, 2020 5:15:57 PM
Time Spent: 00:00:30
IP Address: 174.245.195.226

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#12

INCOMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, March 03, 2020 3:39:53 PM
Last Modified: Tuesday, March 03, 2020 3:56:09 PM
Time Spent: 00:16:15
IP Address: 75.151.92.61

Page 2: Affiliation

Q1 Select affiliation (select one): **Member of the public**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here: **Respondent skipped this question**

#13

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, March 03, 2020 10:19:31 PM
Last Modified:	Tuesday, March 03, 2020 10:32:14 PM
Time Spent:	00:12:43
IP Address:	24.40.88.252

Page 2: Affiliation

Q1 Select affiliation (select one): **Nonprofit**

Page 3: Comments

Q2 Please provide comments regarding the Draft Update of the Summit County Multi-Hazard Mitigation Plan here:

Very through.

APPENDIX C: MITIGATION ALTERNATIVES AND PRIORITIZATION

Example Mitigation Action Items

Alternative Mitigation Actions	Dam Failure	Floods	Hazardous Materials	Avalanche Landslides/ Debris Flows/ Rockfalls	Weather Extremes (hail, lightning, wind, temps, drought)	Earthquakes	Wildland Fires	Severe Winter Storm
PREVENTION								
Building codes and enforcement		■	■	■	■	■	■	■
Comprehensive Watershed Tax		■						
Density controls	■	■	■	■			■	
Design review standards		■	■	■		■	■	
Easements		■	■	■			■	
Environmental review standards		■	■	■		■	■	
Floodplain development regulations	■	■	■					
Hazard mapping	■	■	■	■			■	
Floodplain zoning	■	■	■					
Forest fire fuel reduction			■				■	
Housing/landlord codes			■		■			
Slide-prone area/grading/hillside development regulations				■			■	
Manufactured home guidelines/regulations		■			■	■		
Minimize hazardous materials waste generation			■					
Multi-Jurisdiction Cooperation within watershed	■	■						
Open space preservation	■	■		■			■	
Performance standards	■	■		■	■	■	■	■
Periodically contain/remove wastes for disposal			■					
Pesticide/herbicide management regulations			■					
Special use permits	■	■	■	■			■	
Stormwater management regulations		■	■					
Subdivision and development regulations	■	■	■	■		■	■	

Alternative Mitigation Actions	Dam Failure	Floods	Hazardous Materials	Avalanche Landslides/ Debris Flows/ Rockfalls	Weather Extremes (hail, lightning, wind, temps, drought)	Earthquakes	Wildland Fires	Severe Winter Storm
Surge protectors and lightning protection					■			
Tree Management					■		■	■
Transfer of development rights		■		■			■	
Utility location			■	■	■			■
PROPERTY PROTECTION								
Acquisition of hazard prone structures	■	■		■			■	
Facility inspections/reporting	■	■	■			■		
Construction of barriers around structures	■	■	■					
Elevation of structures	■	■						
Relocation out of hazard areas	■	■	■	■			■	
Structural retrofits (e.g., reinforcement, floodproofing, bracing, etc.)		■	■		■	■	■	■
PUBLIC EDUCATION AND AWARENESS						■		
Debris Control		■		■				
Flood Insurance	■	■						
Hazard information centers	■	■	■	■	■	■	■	■
Public education and outreach programs	■	■	■	■	■	■	■	■
Real estate disclosure	■	■	■	■	■	■	■	■
Crop Insurance					■	■		
Lightning detectors in public areas					■			
NATURAL RESOURCE PROTECTION								
Best Management Practices (BMPs)		■	■	■	■		■	
Forest and vegetation management	■	■		■	■		■	■
Hydrological Monitoring	■	■	■	■	■			
Sediment and erosion control regulations	■	■	■	■				
Stream corridor restoration		■		■				
Stream dumping regulations		■	■					
Urban forestry and landscape management		■		■	■		■	■

Alternative Mitigation Actions	Dam Failure	Floods	Hazardous Materials	Avalanche Landslides/ Debris Flows/ Rockfalls	Weather Extremes (hail, lightning, wind, temps, drought)	Earthquakes	Wildland Fires	Severe Winter Storm
Wetlands development regulations		■	■	■			■	
EMERGENCY SERVICES								
Critical facilities protection	■	■	■	■	■	■	■	■
Emergency response services	■	■	■	■	■	■	■	■
Facility employee safety training programs	■	■	■	■	■	■	■	■
Hazard threat recognition	■	■	■	■	■	■	■	■
Hazard warning systems (community sirens, NOAA weather radio)	■	■	■	■	■	■	■	■
Health and safety maintenance	■	■	■	■	■	■	■	■
Post-disaster mitigation	■	■	■	■	■	■	■	■
Evacuation planning	■	■	■	■			■	
STRUCTURAL PROJECTS								
Channel maintenance		■						
Dams/reservoirs (including maintenance)	■	■						
Isolate hazardous materials waste storage sties			■					
Levees and floodwalls (including maintenance)		■						
Safe room/shelter					■	■		■
Secondary containment system			■					
Site reclamation/restoration/revegetation		■	■	■				
Snow fences								■
Water supply augmentation					■			

Does the proposed action protect lives?

Does the proposed action address hazards or areas with the highest risk?

Does the proposed action protect critical facilities, infrastructure, or community assets?

Does the proposed action meet multiple objectives (multi-objective management)?

STAPLE/E

Developed by FEMA, this method of applying evaluation criteria enables the planning team to consider in a systematic way the social, technical, administrative, political, legal, economic, and environmental opportunities and constraints of implementing a particular mitigation action. For each action, the HMPC should ask, and consider the answers to, the following questions:

Social

Does the measure treat people fairly (different groups, different generations)?

Technical

Will it work? (Does it solve the problem? Is it feasible?)

Administrative

Is there capacity to implement and manage project?

Political

Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support it?

Legal

Does your organization have the authority to implement? Is it legal? Are there liability implications?

Economic

Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development? Does it reduce direct property losses or indirect economic losses?

Environmental

Does it comply with environmental regulations or have adverse environmental impacts?

APPENDIX D: HAZARD MITIGATION PLANNING COMMITTEE

Department/Agency	Title	Name	Participating Jurisdiction	Stakeholder	Meetings[1] Attended
Summit County					
Planning Department	Director	Don Reimer	X		Kickoff; Mtg #2;
Office of Emergency Management	Emergency Manager	Brian Bovaird	X		Kickoff; Mtg #2; Mtg #3
Public Works Division	Director	Tom Gossiorowski	X		Kickoff;
Community Development Division	CSU Extension Director – Summit	Dan Schroder	X		Kickoff; Mtg #2; Mtg #3
Community Development Division	Director	Jim Curnute	X		Mtg #2; Mtg #3
Public Health Department	Environmental Health Manager	Dan Hendershott	X		Mtg #2; Mtg #3
County Manager's Office	Assistant Manager	Sarah Vaine	X		Mtg #2; Mtg #3
Road and Bridge Department	Director/ County Engineer	Robert Jacobs	X		Mtg #3
Town of Blue River					
Town Hall	Town Manager	Michelle Eddy	X		Kickoff; Mtg #2; Mtg #3
Town of Breckenridge					
Recreation	Director	Scott Reid	X		Mtg #3
Town of Dillon					
Public Works	Director	Scott O'Brien	X		Kickoff; Mtg #3
Police	Chief	Mark Heminghous	X		Mtg #3
Town of Frisco					
Public Works	Assistant Director	Addison Canine	X		Kickoff; Mtg #2; Mtg #3
Community Development	Interim Director	Bill Gibson	X		Kickoff; Mtg #3
Town of Silverthorne					
Public Works	Director	Tom Daugherty	X		
Town of Montezuma					
Town of Montezuma	Mayor	Leslie Davis	X		
Fire Protection Districts					
Summit Fire & EMS	Chief	Jeff Berino	X		Kickoff;
Summit Fire & EMS	Deputy Chief	Bruce Farrel	X		Kickoff; Mtg #3
Summit Fire & EMS	Division Chief	John Hall	X		Kickoff; Mtg #2; Mtg #3

[1] Those that are not listed as attending a meeting participated in the planning process in other ways such as emails, phone calls and face-to-face meetings with the County Emergency Manger and consultants.

Department/Agency	Title	Name	Participating Jurisdiction	Stakeholder	Meetings[1] Attended
Red, White & Blue	Deputy Chief	Jay Nelson	X		Kickoff; Mtg #2; Mtg #3
Special Districts					
Copper Mountain Consolidated Metropolitan District	Manager	Bryan Webinger	X		Mtg #3
Denver Water	Emergency Manager	Rebecca Franco	X		Kickoff; Mtg #2
Denver Water	Dillon Dam Supervisor	John Blackwell	X		Kickoff
Denver Water	Dillon Dam Operations Supervisor	Tyler Johnson	X		Mtg #3
Dillon Valley District	Administrator	Deborah Polick	X		Kickoff; Mtg #2; Mtg #3
Hamilton Creek Metropolitan District	Administrator	Tom Oberheide	X		Kickoff; Mtg #2; Mtg #3
East Dillon Water District	Administrator	Tom Oberheide	X		Kickoff; Mtg #2; Mtg #3
Mesa Cortina Water & Sewer District	General Manager	Jeff Leigh	X		Kickoff; Mtg #2
Snake River Water District	Executive Director	Scott Hill	X		
Buffalo Mountain Metropolitan District	Manager	Shellie Duplan	X		Kickoff; Mtg #2; Mtg #3
Other Partners and Stakeholders					
Breckenridge Ski Resort	Sr. Director Mountain Operations	Jeff Zimmerman		X	Kickoff; Mtg #2;
Colorado Department of Transportation	Operations Manager – I-70 Corridor	Fritz Homann		X	Mtg #3
Colorado Mountain College	Assistant Dean	J. Scott Marr		X	Kickoff;
Colorado State Patrol	Captain	Jared Rapp		X	Kickoff;
Copper Mountain	Risk and Safety Manager	Bec Bale		X	Mtg #2; Mtg #3
Keystone Science School	Director of Education	Andrew Dandy		X	Kickoff; Mtg #2;
Keystone Science School	Safety Manager	Logan Macelean		X	Mtg #2; Mtg #3
Keystone Ski Resort	Health and Safety Manager	David Paradysz		X	Mtg #2; Mtg #3
Lower Blue	Resident	Jim Donlon		X	Mtg #2
Summit Foundation	Director	Taryn Power		X	Kickoff; Mtg #3
Summit Schools	COO	Drew Adkins		X	Kickoff;
U.S. Forest Service	Fuels Specialist	Eric White		X	Kickoff;

Department/Agency	Title	Name	Participating Jurisdiction	Stakeholder	Meetings[1] Attended
U.S. Forest Service	District Ranger	Bill Jackson		X	Kickoff; Mtg #2
U.S. Forest Service	Assistant FMU – White River National Forest	Justin Conrad		X	Mtg #2
Water Solutions Inc.	Operations	Matt Willitts		X	Kickoff
Xcel Energy	Area Manager	Kelly Flenniken		X	Mtg #2
Wood Environment and Infrastructure Solutions, Inc. Planning Team					
Wood	Project Manager	Jeff Brislawn			
Wood	Senior Planner	Scott Field			
Wood	Hazard Mitigation Planner	Amy Carr			
Wood	GIS Analyst/ Planner	Marta Blanco Castano			

APPENDIX E: PLAN ADOPTION

Note: The records of adoption will be incorporated as an electronic appendix. When the plan is adopted in 2020, the jurisdictions and adoption date will be noted here, but scanned versions of all adoption resolutions will be kept on file with Summit County Emergency Management. A sample adoption resolution is provided here.

Multi-Hazard Mitigation Plan Adoption Sample Resolution

Resolution # _____

Adopting the Summit County
Multi-Hazard Mitigation Plan 2020

Whereas, *(name of county or community) 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 Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and*

Whereas, *(name of county or community) resides within the Planning Area, and fully participated in the mitigation planning process to prepare this Multi-Hazard Mitigation Plan; and*

Whereas, *the Colorado Office of Emergency Management and Federal Emergency Management Agency, Region VIII officials have reviewed the Summit County Multi-Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body; and*

Now, therefore, be it resolved, *that the (name of board or council), hereby adopts the Summit County Multi-Hazard Mitigation Plan, as an official plan; and*

Be it further resolved, *Summit County Emergency Management will submit this Adoption Resolution to the Colorado Department of Homeland Security and Emergency Management and Federal Emergency Management Agency, Region VIII officials to enable the Plan's final approval.*

Passed: ___(date)___

_____

Certifying Official